Geotechnical Exploration Report

MCDONALDS NO. 51052
295 Eby Creek Road
Eagle, CO

Prepared for:
McDonald's USA
110 N Carpenter Street
Chicago, Illinois 60607

Prepared By:
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October 2, 2025
Project No. A25170.01259.000

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

Attention: Robert Yagusesky

Reference: Geotechnical Engineering Report
McDonalds No. 52052 - Eagle
295 Eby Creek Road
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UES Professional Solutions, LLC ("UES") is pleased to submit this Geotechnical Engineering Report for the referenced project. This report includes the results from the field exploration and laboratory testing program, along with recommendations for use in the preparation of the appropriate design and construction documents for this project.

UES appreciates the opportunity to provide this Geotechnical Engineering Report and looks forward to continuing participation during the design and construction phases of this project. UES also has great interest in providing construction services, including materials testing and inspection services during the construction of this project, and will be glad to meet with you to further discuss how we can be of assistance as the project advances.

If there are questions pertaining to this report, or if UES may be of further service, please contact us at your convenience.

Respectfully,
UES

Lee J. Mitchell, P.E. (NV, UT)
Senior Geotechnical Engineer

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Principal Engineer

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1.0 INTRODUCTION

UES has completed the geotechnical exploration for the proposed McDonald's restaurant located at 295 Eby Creek Road in Eagle, CO. The purposes of this study were to explore the existing soil, geological, and groundwater conditions at the site, and to provide geotechnical engineering conclusions and recommendations for use by the other members of the design team for design and construction of the proposed project. This report presents the results of our study.

1.1 AUTHORIZATION

UES (Consultant) has completed a field exploration and geotechnical evaluation for the McDonald's - Eagle, Colorado project. Mr. Todd Wright, representing McDonald's USA, authorized UES services via Purchase Order No. 2879043 on August 22, 2025.

1.2 PROPOSED DEVELOPMENT

Based on a review of the "Concept Plan 7", sent to UES by the Client, UES understands the renovation of an existing slab-on-grade, one story McDonald's with a drive through approximately 3,572 square feet in plan area. Maximum column and wall loads are assumed to be approximately 80 kips and 2.5 kips per lineal foot, respectively.

Associated improvements will consist of new and/or improved asphalt concrete parking areas, exterior concrete flatwork, and underground utilities. Based on our experience, the drive through and truck access areas will consist of Portland cement concrete pavement. We anticipate the building will develop relatively light to moderate structural loads based on this type of construction.

A grading plan was not available when this report was prepared. However, based on existing site topography and our understanding of the proposed construction, we anticipate cuts and fills on the order of about one to three feet will be required to establish final subgrade levels across the site.

1.3 SCOPE OF WORK

Our scope of work included the following:

- Site reconnaissance
- Review of United States Geological Survey (USGS) topographic maps, aerial photographs and available groundwater data
- Review of geologic maps and fault maps
- Subsurface exploration, including the drilling and sampling of five (5) borings to target depths ranging from 10 to 25 feet below the ground surface (bgs).
- Laboratory testing of selected soil samples
- Engineering analyses
- Preparation of this report

2.0 SITE INFORMATION

2.1 SITE DESCRIPTION

The project site is located within the northwest quadrant of I-70 and Eby Creek Road in Eagle, Colorado. The property consists of an existing single-story building previously utilized as a restaurant and occupies approximately 1.07 acres.

The topography of the site is relatively flat with an overall relief of approximately 7 feet sloping from east to west. The average surface elevation within the planned building areas is about 7,216 feet above mean sea level based on review of Google Earth Imagery.

2.2 SITE HISTORY

UES reviewed historical aerial photographs of the site available from the Historicaerials.com website and Google Earth. Available photographs were taken in 1951, 1960, 1983, 1999, 2005, 2009, 2017, and 2023. Review of the 1951 and 1960 aerial photographs reveal the area to be rural and undeveloped, with the land primarily used for agriculture. I-70 was not constructed at the time of these photographs. The 1983 aerial photo shows I-70 and the re-routing of Eby Creek Road. Much of the agricultural activity appears to have been replaced by commercial development. The 1999 aerial photograph shows the building and parking area on the subject property with additional commercial development to the east of Eby Creek Road and south of I-70. The 2005 and 2009 aerial photographs do not show any significant changes to the property or surrounding area. The 2017 aerial photograph shows the two roundabout intersections at the westbound I-70 exit ramp and at the access point to the subject property. The site has remained essentially unchanged since the 2017 and 2023 photographs until our field exploration in August of 2025.

2.3 GEOLOGICAL SETTING

The site is located approximately 90 miles west of the Denver metropolitan area. Surficial geologic conditions at the site, as mapped by the U.S. Geological Survey (USGS) (Lidke, 2002[1]), consist of Alluvium and Colluvium deposits of Holocene and Upper Pleistocene Age. Bedrock underlying the surface units consists of sandstone and other bedrock formations of Upper & Lower Cretaceous Age. Refer to Figure No. 3, Geologic Map.

The mapped geology was found to be consistent with the subsurface soil conditions encountered within our borings performed at the site to the explored depths of approximately 5½ to 11 ½ feet below existing site grades.

2.4 SEISMIC DESIGN PARAMETERS

The 2021 International Building Code (IBC) requires that a default Site Class D be assumed for seismic design when soil conditions for the top 100 feet are not known in sufficient detail for determination in accordance with Table 20.3-1 of ASCE Standard 7.

[1] Lidke, David J., 2002, ***Geologic Map of the Eagle Quadrangle, Eagle County, Colorado***, United States Geological Survey, Map MF-2361.

The site is located at approximately the following latitude and longitude: 39.6604, -106.8291.

A search of the USGS Earthquake Hazards Program's ASCE 7-16 data, as published by the ASCE 7 Hazard Tool (https://asce7hazardtool.online/), indicated the following spectral acceleration parameters for the location indicated above and a Site Class D:

Table 2-1: Ground Motion Values

Period (sec)	Mapped MCE Spectral Response Acceleration (g)		Site Coefficients		Adjusted MCE$_R$ Spectral Response Acceleration (G)		Design Spectral Response Acceleration (g)	
0.2	S_s	0.348	F_a	1.521	S_{Ms}	0.530	S_{Ds}	0.353
1.0	S_1	0.080	F_v	2.4	S_{M1}	0.192	S_{D1}	0.128

3.0 FIELD EXPLORATION & LABORATORY PROGRAM

3.1 Field Activities

The scope of our services for this project included a subsurface exploration program. The subsurface exploration program consisted of drilling five (5) borings to target depths ranging from approximately 10 to 25 feet below existing site grades on September 2, 2025, at the approximate locations shown on the attached Site Plan. The borings were logged during drilling by a graduate geologist and samples were obtained to aid in material classification and for possible laboratory testing. The approximate locations of the borings are shown in the Project Site Plan. The locations of the boring were determined in the field by using a tablet GPS. The locations of the borings should be considered accurate only to the degree implied by the method used. Results of the boring are presented in the Appendix. At the completion of our field explorations, the borings holes were backfilled with auger cuttings per the UES proposal.

3.2 Lab Program

The soil samples collected in the field as part of our field exploration were transported to our lab. Laboratory tests were conducted to determine certain physical and chemical properties of the soils. The laboratory testing results are presented in the Appendix.

3.3 Subsurface Conditions

Fill was encountered in all borings. Fill consisted of 2½ to 3 inches of asphalt at the surface, overlying aggregate base to a depth of about 10 inches, overlying silty sand with gravel to depths ranging from 1½ to 2½ feet. However, due to previous site development/grading there could be deeper and/or poorer quality fill in other areas of the site beyond our explorations.

Natural soils consisted of dense to very dense silty gravel with sand and clayey gravel with sand to the boring termination depths in borings B-1 through B-4. Moderately hard sandstone was encountered in boring B-5 at a depth of 5 feet to the boring termination depth of 11½ feet. Auger refusal was encountered on bedrock in borings B-2, B-3 and B-4. Refer to Table 3-1 below for depths to auger refusal.

Table 3-1: Depth to Bedrock

BORING NO.	DEPTH TO AUGER REFUSAL (FT)	MATERIAL
B-2	9.0	Bedrock
B-3	5.5	Bedrock
B-4	11.0	Bedrock

Groundwater was not encountered during our exploration. Groundwater may fluctuate with seasonal variations/precipitation, irrigation practices and due to groundwater withdrawal and recharge. The boring logs and laboratory test results presented in Appendix A should be referred to for more detailed information.

3.4 GROUNDWATER

Groundwater was not encountered within the maximum explored borings to depths of approximately 11½ feet, performed on September 2, 2025.

To supplement the groundwater data, we reviewed available data published by the Colorado Department of Water Resources (DWR) from wells located within one mile northeast and northwest of the site. Our findings are reported in Table 3-2, below.

Table 3-2: Well log query

Well Log Number	Distance From Site [miles]	Date of Last Record	Depth to Groundwater [ft]
SC00408433CBD	0.37	2003	6.26*
SC00408431DDB	0.93	2003	125

*Well is located adjacent to Eagle River

3.4.1 Groundwater Effect on Development and Seasonal Water

Review of available groundwater data revealed the groundwater elevation at nearby ~~monitoring~~ wells has ranged from 6 to 125 feet below the existing well ground surface. Groundwater levels at the site should be expected to fluctuate throughout the year based on variations in seasonal precipitation, local pumping, and other factors. Locally perched shallower groundwater may be encountered.

Based on our subsurface exploration, experience at the site, and review of groundwater information near the site, the permanent groundwater table will not likely be a significant factor in construction for excavations extending less than 15 feet below the ground surface. However, it is possible that perched groundwater may be encountered in excavations if construction begins in the winter and early spring months. If groundwater is encountered, the use of sumps, submersible pumps, deep wells or a well point system could be used as methods to lower the groundwater level. The dewatering method used will depend on the soil conditions, depth of the excavation and amount of groundwater present within the excavation. Dewatering, if required, should be the contractor's responsibility. The dewatering system should be designed and constructed by a dewatering contractor with local experience. We recommend the selected dewatering system lower the groundwater level to at least two feet below the bottom of the proposed excavations.

During the wet season, infiltrating surface runoff water can create saturated surface conditions. Earthwork operations attempted following the onset of winter rains and prior to prolonged drying periods will be hampered by high soil moisture contents.

3.5 CORROSION

3.5.1 Soil Corrosion Potential

Three soil samples were tested to determine minimum resistivity, pH, total solids, chloride, and sulfate concentrations to help evaluate the potential for corrosive attack upon reinforced concrete and buried metal. Copies of the corrosion potential test results are presented in Appendix B.

A site is generally considered to be corrosive to foundation elements if one or more of the following conditions exists for the representative soil and/or water samples taken: has a chloride concentration greater than or equal to 500 ppm, sulfate concentration greater than or equal to 1500 ppm, or the pH is 5.5 or less. Based on this criterion, the on-site, near-surface soil should be considered damaging to normal strength concrete and corrosive to steel reinforcement properly embedded within PCC or foundation for the samples tested.

Using the American Concrete Institute (ACI) 318 Table 19.3.1.1 - Exposure Categories and Classes, we recommend the exposure categories provided in Table 3-3. The project Structural Engineer should review the requirements of ACI 318 and determine their applicability to the site.

Table 3-3: Concrete exposure categories and classes (ACI 318)

Category	Class	Condition
Freezing and thawing	F3	Concrete exposed to freezing-and-thawing cycles with frequent exposure to water and exposure to deicing chemicals
Sulfates	S0	Negligible
In contact with water	W1	Concrete in contact with water and low permeability is required
Corrosion Protection of reinforcements	C2	Concrete exposed to moisture and an external source of chlorides

UES are not corrosion engineers. Therefore, if it is desired to further define the soil corrosion potential at the site, a Corrosion Engineer should be consulted.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 GEOTECHNICAL DISCUSSION

Our recommendations are based on the assumption that the soil conditions are similar to those disclosed by the explorations. If variations are noted during construction or if changes are made in the site plan, structural loading, foundation type or floor level, we should be notified so we can supplement our recommendations, as applicable.

Our subsurface explorations revealed that the project site's coarse-grained soils are typical of the vicinity's mapped geology.

As indicated, there was fill on-site. This fill would be considered uncontrolled fill unless observation and testing were performed during placement. All uncontrolled fill should be removed and replaced with properly compacted fill. The uncontrolled fill soils can be re-used for controlled fill provided almost all oversized material, unsuitable material (as determined by the geotechnical engineer), vegetation, and debris are removed, as determined by visual observation by the 3rd party inspector.

Bedrock and partially cemented soils were encountered in the majority of our borings. Bedrock was initially encountered at a depth of 5½ feet. Hence, bedrock is expected to affect the excavation and construction of utilities. Excavating through bedrock will require heavy-duty ripping equipment, rock saw and other special equipment. In addition, large quantities of oversized materials are expected to be generated from excavation of such bedrock and cemented soils and hence will require additional effort to extract such oversized materials particularly in deep, narrow utility excavation trenches. Utility contractors should review the boring logs and satisfy themselves as to the hardness of materials and equipment required, and should plan and budget accordingly.

Native soils utilized as engineered fill should meet the criteria outlined in *Section 4.3.3* of this report. Engineered fill, properly placed and compacted in accordance with the recommendations of this report, will be capable of supporting the proposed structures and pavements.

4.2 Site Preparation

Strip and remove existing vegetation, topsoil, debris, uncontrolled fill (where encountered), all loose or disturbed natural soils, and other deleterious materials from proposed building areas, adjacent walks and slabs, and in areas to be paved. Excavations should extend at least 5 feet beyond the areas to be improved in plan view. Uncontrolled fill is defined as any existing fill that was not properly placed, observed and tested.

Where the proposed new foundations or other improvements are too close to existing foundations or property line to allow for full 5 feet lateral site preparation or overbuild of foundation without undermining the existing foundations or encroaching into adjacent parcel, lateral overexcavation or site preparation may be reduced or eliminated. As much lateral overbuild and site preparation as possible should be implemented without undermining the adjacent existing footing or encroaching into adjacent property.

All exposed surfaces should be free of mounds and depressions which could prevent uniform compaction.

If unexpected fills or abandoned structures/improvements are encountered during site clearing, such features should be removed and the excavation thoroughly cleaned and backfilled. All excavations should be observed by the geotechnical engineer prior to backfill placement.

Demolition of existing structures/improvements should include removal of any foundation system and utilities. Any excavations as a result of demolition and removal should be properly filled.

All materials derived from the demolition of existing structures/improvements should be removed from the site, and not be allowed for use in any fills. In some cases, existing pavements, if properly broken up, can be used in required fills. The geotechnical engineer should determine the suitability for use based on conditions in the field.

4.3 EARTHWORK

Earthwork should be performed in accordance with the guidelines presented in Chapter 18 of the 2021 IBC, except where specific recommendations are presented in this report. It is recommended that contractors perform their own reconnaissance of the site. If the contractors have any questions regarding site conditions, site preparation, or recommendations in this report, they should contact a representative of UES.

4.3.1 Subgrade Preparation

Following site clearing activities, areas designated to receive fill, at-grade areas, or those achieved by excavation should be scarified to a depth of at least 12 inches, moisture conditioned and compacted as recommended in the Fill Placement and Compaction Section of this report.

Difficulty in achieving the recommended compaction may require drying the near-surface subgrade to a compactable moisture content, removal and replacement. In addition, difficulty in subgrade compaction may be an indication of loose, soft or unstable soil conditions that could require additional excavation. If these conditions exist, additional subgrade stabilization recommendations may be required at the time of construction.

Recommendations to achieve the recommended compaction can be made during construction and will depend on the conditions encountered in the field and other factors, such as project schedule and prevailing weather conditions.

Compaction of all subgrade soils should be performed using a heavy, self-propelled, smooth steel drum compactor capable of achieving the required compaction and must be performed in the presence of the Geotechnical Engineer's representative who will evaluate the performance of subgrade under compactive load. Difficulty in achieving subgrade compaction may be an indication of loose, soft, or unstable soil conditions that could require additional excavation. If these conditions exist, additional subgrade stabilization recommendations may be required at the time of construction.

4.3.2 Excavation

It is anticipated that excavation of the on-site natural non-cemented deposits for the proposed project can be accomplished with conventional earthmoving equipment.

Excavations penetrating moderately hard or relatively thin (less than one foot) hard layers of bedrock should be able to be excavated using heavy-duty equipment.

Excavations penetrating hard or very hard bedrock will require special consideration where they are to be performed.

Contractors, especially those excavating for utilities, should satisfy themselves as to the hardness of materials and equipment required.

Some additional effort may be necessary to extract boulder-sized materials, particularly in deep, narrow excavations such as utility trenches.

Temporary unsurcharged construction excavations should be sloped or shored. Slopes should not be steeper than 2 (horizontal) to 1 (vertical). Slopes may need to be flattened depending on conditions exposed during construction. Exposed slopes should be kept moist (but not saturated) during construction.

If there is not enough space for sloped excavations, shoring should be used. Traffic and surcharge loads should be kept back at least 10 feet from the top of the excavation.

Underpinning may be required to protect the existing structure if excavations will be deeper than existing foundations. If underpinning is utilized during foundation construction, please refer to *Section 1803.5.7, 1804.1,* and *1804.2* of the *2018 IBC* for underpinning design requirements to be prepared by a registered design professional. Excavations near foundations that may affect the vertical or lateral support of that existing foundation should be evaluated for stability by a registered design professional on a case-by-case basis.

If excavations, including utility trenches, are extended to a depth of more than 20 feet, OSHA requires that the protective system of such excavations be designed by a professional engineer. Excavation, trenching and shoring should be conducted in accordance with the *U.S. Department of Labor Occupational Safety and Health Administration's (OSHA) Excavation and Trenching Standard, Title 29 of the Code of Federal Regulation (CFR), Part 1926.650*. The safety of construction personnel is the responsibility of the contractor.

4.3.3 Engineered Fill Materials and Placement

The on-site granular soils encountered in our borings are considered suitable for use in engineered fill construction, provided these materials do not contain rubble, rubbish, significant organic concentrations, and are at a workable moisture content appropriate for compaction.

Soils containing clay within the soil matrix should not be allowed to dry out such that cracking occurs during or after grading. Sufficient moisture contents should be maintained, to prevent cracking, at least until foundations, floor slabs, flatwork, and pavements are constructed. Any significantly dried or cracked soils could be wetted until they reach acceptable moisture contents or they could be excavated and replaced with acceptable properly compacted fill. In addition, no fill or foundation concrete should be placed on frozen ground/subgrade.

Fill materials shall not be placed, spread or compacted while the ground is frozen or during unfavorable weather conditions. When site grading is interrupted by heavy rain, filling operations shall not resume until the Geotechnical Engineer approves the moisture and density conditions of the previously placed fill.

Imported fill materials, should be granular, compactable materials with a Plasticity Index of 12 or less when tested in accordance with ASTM D4318; an Expansion Index of 20 or less when tested in accordance with ASTM D4829; an organic content less than four percent; do not contain particles greater than three inches in maximum dimension, and be within a compactable moisture content. Imported fill should be observed and approved by the Geotechnical Engineer at least three business days prior to being transported to the site. Also, if import fills are required (other than aggregate base), the contractor must provide appropriate documentation that the import is clean of known contamination and within acceptable corrosion limits.

Structural fill should be observed and tested as necessary to determine compliance with the compaction requirements presented in this report. In general, one compaction test should be performed for approximately every 500 cubic yards of fill, one for one foot of fill placed, or change in material. Structural fill should be placed in lifts not exceeding six inches in compacted thickness with each lift being uniformly moisture conditioned to at least the optimum moisture content and compacted to not less than 98 percent of the maximum dry density per ASTM D698. Refer to Table 4-1 for additional information.

The upper six inches of pavement subgrade should be moisture conditioned to at least the optimum moisture content and compacted to no less than 95 percent relative compaction, regardless of whether final subgrade is achieved by excavation, filling or left at existing grade. Final pavement subgrade processing and compaction should be performed after completion of underground utilities and must be stable under construction traffic prior to aggregate base placement.

Earthwork operations should be accomplished in accordance with the recommendations contained within this report. We recommend the Geotechnical Engineer's representative be present on a regular basis during all earthwork operations to observe and test the engineered fill and to verify compliance with the recommendations of this report and the project plans and specifications.

Table 4-1: Compaction Criteria and Testing Frequency

Material Type (location)	Per ~~Modified~~ Standard Proctor Test (ASTM D698)			
	Minimum Compaction (%)	Moisture Content Range		Testing Frequency (min. 3 per lift)
		Minimum	Maximum	
Engineered Fill (Fine Grained)	95	OMC	+2%	1 per 2,500 sf
Engineered Fill (Coarse Grained) and General Fill (granular)	98	-2%	+2%	1 per 2,500 sf
Subgrade	95	-2%	+2%	1 per 5,000 sf
Aggregate Base (pavements)	98	-2%	+2%	1 per 5,000 sf

Notes: OMC = Optimum Moisture Content

1. For compaction, fine-grained soils are soils with at least 30 percent passing the No. 200 sieve and/or soils having an expansion of less than 4 percent (Expansion Index less than 20).
2. All fill placed deeper than 5 feet below the final grade should be compacted to a minimum of 98 percent at a moisture content of optimum or greater.
3. Retaining wall backfill only need to be compacted to a minimum of 95 percent.

4.4 EXCAVATIONS

4.4.1 Excavation Conditions

The surface and near-surface soils at the site should be able to readily excavatable with conventional earthmoving and trenching equipment. Subsurface remnants from existing and/or previous development of the site, if any, may be encountered and can be slow to excavate with a standard, rubber-tired backhoe; however, experience has shown that excavators can remove these materials with moderate effort.

Based on our borings, excavations associated with building foundations, shallow trenches for utilities, and other excavations less than five feet deep associated with the proposed construction, should stand vertically for short periods of time (i.e., less than one day) required for construction, unless cohesionless, saturated or disturbed soils are encountered. These unstable conditions may result in caving or sloughing; therefore, the contractor should be prepared to brace or shore the excavations, if necessary.

Excavations deeper than five feet that will be entered by workers should be sloped, braced or shored in accordance with current OSHA regulations. The contractor must provide an adequately constructed and braced shoring system in accordance with federal, state, and local safety regulations for individuals working in an excavation that may expose them to the danger of moving ground.

Temporarily sloped excavations should be constructed no steeper than a one (horizontal) to one (vertical) (1H:1V) inclination. Temporary slopes likely will stand at this inclination for the short-term duration of construction, provided significant pockets of loose and/or saturated granular soils are not encountered. Flatter slopes would be required if these conditions are encountered.

Excavated materials should not be stockpiled directly adjacent to an open excavation to prevent surcharge loading of the excavation sidewalls. Excessive truck and equipment traffic should be avoided near excavations. If material is stored or heavy equipment is stationed and/or operated near an excavation, a shoring system must be designed to resist the additional pressure due to the superimposed loads.

4.4.2 Utility Trench Backfill

Utility trench backfill should be mechanically compacted as engineered fill in accordance with the following recommendations. Bedding and initial backfill around and over the pipe should conform to the pipe manufacturers' recommendations for the pipe materials selected and applicable sections of the governing agency standards.

Utility trench backfill should be placed in thin lifts, thoroughly moisture conditioned to at least the optimum moisture content and compacted to at least 95 percent of the maximum dry density as determined by ASTM D698. The lift thickness will depend on the type of compaction equipment used to backfill utility trenches.

Within the upper six inches of pavement subgrade soils, compaction should be increased to at least 95 percent relative compaction at no less than two percent above the optimum moisture content.

Backfill for the upper 12 inches of trenches must match the adjacent materials.

We recommend that all underground utility trenches aligned nearly parallel with new foundations be at least three feet from the outer edge of foundations, wherever possible. Trenches should not encroach into the zone extending outward at a one (horizontal) to one (vertical) (1H:1V) inclination below the bottom of foundations. The intent of these recommendations is to prevent loss of both lateral and vertical support of foundations, resulting in possible settlement.

4.5 FOUNDATIONS

If the grading recommendations presented in the Earthwork section of this report are complied with, the proposed structures, additions and any block walls or retaining walls may be supported by conventional type foundations. Foundations should be established on native soils at least medium dense in consistency or properly compacted fill as discussed in *Section 4.3.3* above.

Soil-moisture changes below foundations and floor slabs is the major factor in damages relating to soils. Settlement of the proposed structures, supported as recommended, should be within acceptable limits as provided above. However, if the soils beneath foundations experience an increase in moisture, settlement could occur and cause additional movement of a structure. Therefore, it is important that the recommendations presented in the Drainage and Moisture Protection section of this report be adhered to.

4.5.1 Shallow Foundations

If the grading recommendations presented in the Earthwork section of this report are complied with, the proposed structure, additions and any block walls or retaining walls may be supported by conventional type foundations. Foundations should be established on native soils at least medium dense in consistency or properly compacted fill. Parameters for foundations are shown in the table below. These parameters should be used for design of all grade beams bearing on recompacted fill soils as recommended.

Table 4-5.1: Foundation Design Parameters

Description	Parameter
Allowable bearing pressure [1,2]	3,500 psf (soil)
Minimum width [3]	12 inches
Minimum embedment depth [3, 4]	48 inches
Anticipated total settlement	Less than 1 inch
Anticipated differential settlement[5]	Less than ½ inch

Notes:
1. The bearing value may be increased by 500 psf for each additional 12 inches of embedment up to a maximum of 4,000 psf.
2. A one-third increase may be used for wind or seismic loads.
3. Minimum width and embedment depth are for conventional spread footings or the thickened edge of post-tension slab foundations.
4. Below the lowest adjacent final compacted subgrade (generally pad grade before landscaping; exterior footings) or the top of the finished floor slab (interior footings).
5. Differential settlements may be as much as ½ total settlement within a distance of 50 feet or the least dimension of the structure, whichever is less.

We recommend that all foundations be adequately reinforced to provide structural continuity, mitigate cracking and permit spanning of local soil irregularities. The structural engineer or civil engineering consultant should determine final foundation reinforcing requirements. It should be noted again that concrete shall not be placed on frozen subgrade/ground.

Resistance to lateral displacement of shallow foundations may be computed using an allowable friction factor of 0.42 multiplied by the effective vertical load on each foundation. Additional lateral resistance may be achieved using an allowable passive earth pressure against the vertical projection of the foundation equal to an equivalent fluid pressure of 240 psf per foot of depth. These two modes of resistance should not be added unless the frictional component is reduced by 50 percent since mobilization of the passive resistance requires some horizontal movement, effectively reducing the frictional resistance.

4.5.2 Interior Floor Slab Support

Interior concrete slab-on-grade floors can be supported upon the soil subgrade prepared in accordance with the recommendations in this report and maintained in that condition (optimum moisture) and are protected from disturbance. Slabs-on-grade should be at least four inches thick, and final thickness, reinforcement and joint spacing should be determined by the slab designer. Proper and consistent location of the reinforcement near mid-slab is essential to its performance. The risk of uncontrolled shrinkage cracking is increased if the reinforcement is not properly located within the slab.

Interior floor slabs should be underlain by a layer of free-draining gravel/crushed rock, serving as a deterrent to migration of capillary moisture. The gravel/crushed rock layer should be between four and six inches thick and graded such that 100 percent passes a one-inch sieve and less than five percent passes a No. 4 sieve. Additional moisture protection may be provided by placing a plastic, water vapor retarder (at least 10-mils thick) directly over the gravel/crushed rock. The water vapor retarder should meet or exceed the minimum specifications for plastic water vapor retarders as outlined in ASTM E1745 and be installed in strict conformance with the manufacturer's recommendations.

Floor slab construction practice over the past 30 years or more has included placement of a thin layer of sand or pea gravel over the vapor retarder membrane. The intent of the sand/ pea gravel is to aid in the proper curing of the slab concrete. However, recent debate over excessive moisture vapor emissions from floor slabs includes concern of water trapped within the sand/pea gravel. As a consequence, we consider use of the sand/pea gravel layer as optional and not required from a geotechnical perspective. The concrete curing benefits should be weighed against efforts to reduce slab moisture vapor transmission.

The recommendations presented above are intended to reduce significant soils-related cracking of slab-on-grade floors. Also important to the performance and appearance of a PCC slab is the quality of the concrete, the workmanship of the concrete contractor, the curing techniques utilized and the spacing of control joints.

4.5.3 Floor Slab Moisture Penetration Resistance

It is considered likely that floor slab subgrade soils will become wet to near saturated at some time during the life of structures. This is a certainty when slabs are constructed during the wet seasons, or when constantly wet ground or poor drainage conditions exist adjacent to structures. For this reason, it should be assumed that interior slabs intended for moisture-sensitive floor coverings or materials, require protection against moisture or moisture vapor penetration. Standard practice includes the gravel/crushed rock and vapor retarder as suggested above. However, the gravel/crushed rock and plastic membrane offer only a limited, first line of defense against soil-related moisture; they do not moisture-proof the slab. Recommendations contained in this report concerning foundation and floor slab design are presented as minimum requirements, only from the geotechnical engineering standpoint.

It is emphasized that the use of gravel/crushed rock and plastic membrane below the slab will not "moisture proof" the slab, nor does it assure that slab moisture transmission levels will be low enough to prevent damage to floor coverings or other building components. If increased protection against moisture vapor penetration of slabs is desired, a concrete moisture protection specialist should be consulted. The design team should consider all available measures for slab moisture protection. It is commonly accepted that maintaining the lowest practical water-cement ratio in the slab concrete is one of the most effective ways to reduce future moisture vapor penetration of the completed slabs.

4.6 Exterior Flatwork Construction

The upper 12 inches of final soil subgrade for exterior concrete flatwork areas should consist of approved, imported, compactable, low-expansive (Expansion Index ≤ 20) granular soils and compacted in accordance with the Engineered Fill Construction recommendations included in this report. Exterior flatwork subgrade soils should be maintained in a moist condition and protected from disturbance. Exterior flatwork should be underlain by at least four inches of Class 6 aggregate base compacted to at least 95 percent relative compaction. The aggregate base can be included in the 12 inches of very-low expansive granular soils.

Proper moisture conditioning of the subgrade soils is considered important to the performance of exterior flatwork. Expansion joints should be provided to allow for minor vertical movement of the flatwork. Exterior flatwork should be constructed independent of the perimeter building foundation and isolated column foundations by the placement of a layer of felt material between the flatwork and the foundation.

Exterior flatwork concrete should be at least four inches thick in pedestrian traffic areas and underlain by at least four inches of aggregate base compacted to at least 98 percent of the ASTM D698 maximum dry density. The four inches of aggregate base is not required if the low-expansion imported fill below the flatwork consists of aggregate base.

Consideration should be given to thickening the edges of the slabs at least twice the slab thickness where wheel traffic is expected over the slabs. Expansion joints should be provided to allow for minor vertical movement of the flatwork. Exterior flatwork should be constructed independent of other structural elements by the placement of a layer of felt material between the flatwork and the structural element. The slab designer should determine the final thickness, strength and joint spacing of exterior slab-on-grade concrete. The slab designer should also determine if slab reinforcement for crack control is required and determine final slab reinforcing requirements.

Our recommendations are intended to reduce the effects of variable soil subgrade conditions in exterior concrete flatwork areas. However, some seasonal movement of exterior flatwork should be anticipated where flatwork is adjacent to landscape areas.

Areas adjacent to new exterior flatwork should be landscaped to maintain more uniform soil moisture conditions adjacent to and beneath flatwork. We recommend final landscaping plans not allow fallow ground adjacent to exterior concrete flatwork.

4.7 Drainage Considerations

Foundation soils should generally not be allowed to become saturated during or after construction, except when necessary to increase moisture contents prior to construction. Infiltration of water into foundation or utility excavations should be prevented during construction. Utility lines should be properly installed and the backfill properly compacted to avoid possible sources for subsurface saturation.

Positive drainage away from the structures should be provided during construction and maintained throughout the life of the structure. Any downspouts, roof drains or scuppers should discharge into splash blocks or extensions and away from the structures. Backfill against footings, exterior walls, and in utility trenches should be properly compacted and free of all construction debris to reduce the possibility of moisture infiltration.

If the above recommendations are not followed there would be an increased risk/potential for increasing moisture below foundations and slabs, resulting in additional movement and distress to structures and slabs.

4.8 RETAINING WALLS

For soils above any free water surface, with level backfill and no surcharge loads, we recommend the following equivalent fluid pressures and coefficient of friction:

Table 4-2: Soil Parameters

Soil Parameter	Value
Soil Unit Weight	125 pcf
Internal Angle of Friction	34°
Cohesion	0 psf
Coefficient of Friction	0.42

Table 4-3: Lateral Seismic Pressure

Loading Condition	Lateral Earth Coefficient		Equivalent Fluid Pressures (pcf)
Horizontal backfill	K_0	0.44	55
	K_a	0.28	35
	K_p	3.54	440

Notes:
1. The above values are ultimate and do not include a factor of safety. The designer should employ an adequate factor of safety
2. The above values assume no hydrostatic pressure.
3. Active pressure assumes unrestrained (cantilever) wall and assumes no loading from heavy compaction equipment.
4. Passive pressure should not exceed a maximum of 2,500 psf. A one-third increase may be used for wind or seismic loads.
5. The passive pressure and the frictional resistance of the soils may be combined with a reduction of half of the frictional resistance in determining the total lateral resistance.
6. Passive earth pressures should be considered negligible for block or retaining walls within 5-feet of a descending slope.

If required by the 2021 IBC, the lateral seismic pressure acting on an unrestrained wall can be estimated by the method presented in the following equation, where the dynamic (seismic) lateral thrust, ΔP_{AE}, per linear foot of wall may be determined as follows:

$$\Delta P_{AE} = {}^{3}/_{8}(k_h)H^2\gamma$$

- k_h is equal to $S_{DS}/2.5$
- H is the height of the wall in feet
- γ is equal to the unit weight of the backfill material, in pcf

The resultant dynamic force acts at 0.6H above the base of the wall. This equation applies to level backfill and walls that retain no more than 15 feet.

Where the design includes unrestrained walls, above any free water, with level backfill and no surcharge loads, we recommend the wall be designed to resist an earth pressure with the distribution shown below:

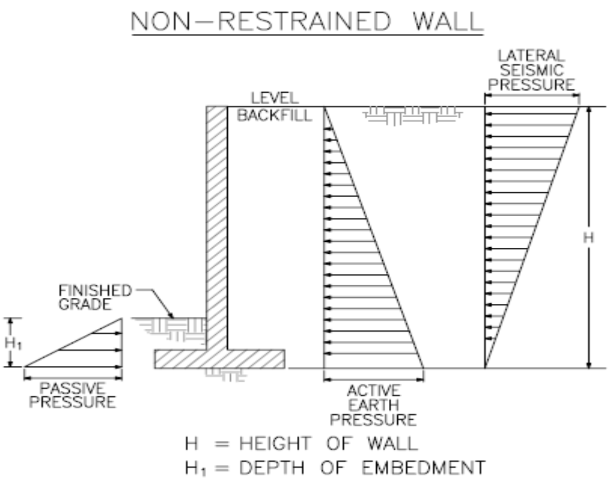


Figure 5-1: Non-restrained Wall

Any surcharge from adjacent loadings should be added to the retaining wall pressures using the K_a factor for non-restrained walls. K_a is presented in the table above. As indicated, the pressures assume that there will be no build-up of hydrostatic pressure. Therefore, if walls are subject to saturated conditions, we recommend weep holes (if practical) and a wall drainage system. The wall drainage may consist of a minimum of 2 cubic feet of drain rock per foot of length of retaining wall wrapped in filter fabric, Mirafi 140N or equivalent, placed at the base of the wall and discharge to an appropriate outlet. Drain rock should consist of clean, uniformly sized gravel, ¾-inch in nominal size. Alternatively, a drainage system including perforated pipe with filter sock placed within the drain rock is also acceptable. The structural fill immediately behind retaining walls (6 to 12 inches) should be granular and free draining. The upper two feet of backfill should consist of compacted native soils. As an option, a prefabricated drain could be used behind the walls. The wall drainage system is an integral part of the retaining wall design. The retaining wall designer is ultimately responsible for the retaining wall design and shall ensure that the above recommended drainage system is compatible with the design of the wall or select a different drainage system at their discretion. All walls below grade should be waterproof or at least dampproof.

Fill against foundations, grade beams and retaining walls should be properly placed and compacted. Backfill should be mechanically compacted in layers (12 inches maximum thickness); flooding should not be permitted. Backfill within a lateral distance equal to the height of retaining walls should be compacted to at least 95 percent of the maximum dry density obtainable by the ASTM D698 method. The backfill materials within this zone should consist of none too low expansive soils. If expansive soils are used within this backfill zone, the wall should be designed to resist the additional pressure that may be exerted by the expansive soils. Backfill outside this zone should be compacted as outlined in the Fill Placement and Compaction section of this report. Care should be taken when placing backfill so as not to damage the walls. Compaction of each lift adjacent to walls should be accomplished with hand-operated tampers or other lightweight compactors. Over-compaction may cause excessive lateral earth pressures which could result in wall movements. Retaining walls should not be backfilled until the concrete or masonry has reached an adequate strength as specified by the wall designer.

4.9 Pavement Design

4.9.1 Pavement Design Recommendations

Based on laboratory test results for the surface and near-surface sandy lean clay soils present at the site, we used an estimated Resistance ("R") value of 50 for pavement subgrades. Pavement sections presented in the table below have been calculated using the above R-values and traffic indices (TIs) assumed to be appropriate for this project, per our experience. The project civil engineer should determine the appropriate traffic index for pavements based on anticipated traffic conditions. If needed, we can provide additional pavement sections for different traffic indices.

Table 4-3: Pavement Design Alternatives

Traffic Index (TI)	Pavement Use	Subgrades R-values = 5		
		Type A Asphalt Concrete (inches)	Portland Cement Concrete (inches)	Class 6 Aggregate Base (inches)
4.5	Automobile Parking Only	2½	--	4
		--	5	4
6.0	Automobile, Light to Moderate Truck Traffic, and Fire Lanes	4	--	4
		--	5	6
7.0	Moderate Truck Traffic, Trash Enclosures, Loading Areas, and Entryways	5	--	8
		--	6	6

We emphasize that the performance of pavements is critically dependent upon uniform and adequate compaction of the soil subgrade, as well as all engineered fill and utility trench backfill within the limits of the pavements. We recommend that pavement subgrade preparation (i.e., scarification, moisture conditioning and compaction) be performed after underground utility construction is completed and just prior to aggregate base placement. All aggregate base should be compacted to at least 98 percent of the maximum dry density determined by ASTM D698.

In the summer heat, high axle loads coupled with shear stresses induced by sharply turning tire movements can lead to failure in asphalt concrete pavements. Therefore, we recommend that consideration be given to using the Portland cement concrete (PCC) pavements in areas subjected to concentrated heavy wheel loading, such as truck turning areas and in front of trash enclosures. These PCC pavements should be designed in accordance with the pavement sections provided in the table above.

We suggest the concrete slabs be constructed with thickened edges in accordance with ACI design standards. Reinforcing for crack control, if desired, should consist of No. 4 reinforcing bars placed on maximum 24-inch centers each way throughout the slab. Reinforcement must be located at mid-slab depth to be effective. Joint spacing and details should conform with the current PCA or ACI guidelines.

Portland cement concrete should achieve a minimum compressive strength of 3500 pounds per square inch at 28 days.

Pavement subgrades must be stable and unyielding under heavy wheel loads of construction equipment. A proof-roll test using a fully loaded water truck should be performed prior to placement of aggregate base to help identify areas that are unstable, as observed by our representative. Areas that are found to be unstable should be excavated to firm, undisturbed materials and restored to grade with compacted aggregate base.

Materials quality and construction within the structural section of the pavement should conform to the applicable provisions of the latest edition of the Caltrans Standard Specifications.

It has been our experience that pavement failures may occur where a non-uniform or disturbed subgrade soil condition is created. Subgrade disturbances can result if pavement subgrade preparation is performed prior to underground utility construction and/or if a significant time period passes between subgrade preparation and placement of aggregate base. Therefore, we recommend that final pavement subgrade preparation (i.e., scarification, moisture conditioning, and compaction) be performed just prior to aggregate base placement.

4.10 PLAN REVIEW

We recommend that our firm be retained to review the final plans and specifications to determine if the intent of our recommendations has been implemented in those documents. We would be pleased to submit a proposal to provide these services upon request.

5.0 GEOTECHNICAL RISK AND LIMITATIONS

Our recommendations are based upon the information provided regarding the proposed construction, combined with our analysis of site conditions revealed by the field exploration and laboratory testing programs. We have used prudent engineering and geologic judgment based upon the information provided and the data generated from our investigation. This report has been prepared in substantial compliance with generally accepted geotechnical engineering practices that exist in the area of the project at the time the report was prepared. No warranty, either express or implied, is provided.

If the proposed construction is modified or relocated or, if it is found during construction that subsurface conditions differ from those we encountered at our boring and/or CPT locations, we should be afforded the opportunity to review the new information or changed conditions to determine if our conclusions and recommendations must be modified.

We emphasize that this report is applicable only to the proposed construction and the investigated site. This report should not be utilized for construction on any other site. This report is considered valid for the proposed construction for a period of two years following the date of this report. If construction has not started within two years, we must re-evaluate the recommendations of this report and update the report, if necessary.

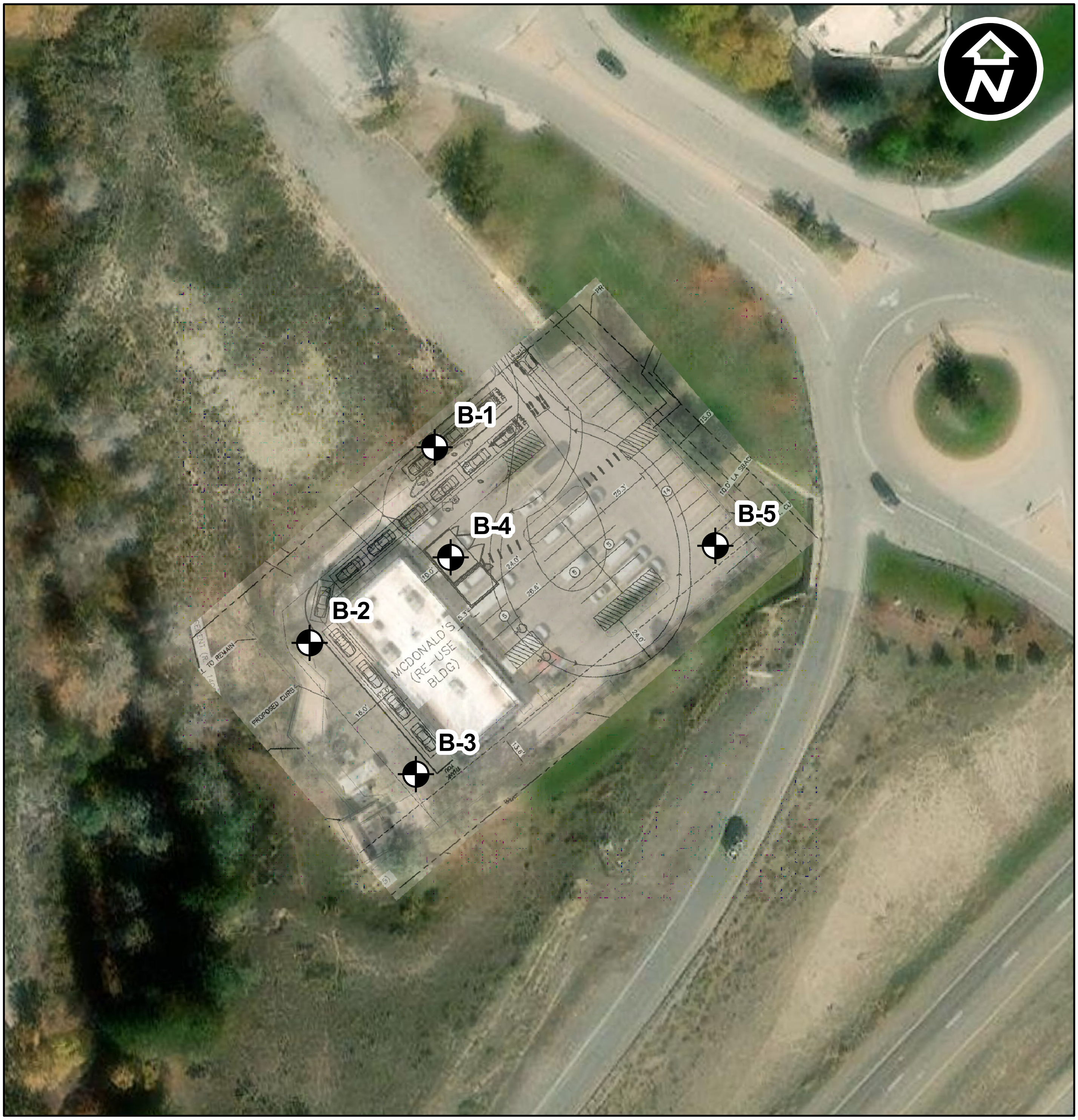
FIGURES

Legend

★ Approximate Project Site

The presented layers were obtained from various sources including ESRI, USGS, USDA, CCBD GISMO, CCFCD, GIS User Community among others. The GIS information is presented for reference only. No warranties, either expressed or implied, are intended or made. If you have any questions regarding this information, please contact UES.

Universal Engineering Sciences	PROJECT: **McDonalds No. 51052 I-70 and Eby Creek Road Eagle, Colorado**	**VICINITY MAP**	
	CLIENT: **McDonalds USA**	PROJECT NO: **A25170.01259**	FIGURE NO: **1**



Feet

0 20 40 80 120 160 200

Legend

Approximate Boring Location

The presented layers were obtained from various sources including USGS, USDA, GIS User Community among others. The GIS information is presented for reference only. No warranties, either expressed or implied, are intended or made. If you have any questions regarding this information, please contact UES.

Universal Engineering Sciences	PROJECT: **McDonalds 51052 I-70 and Eby Creek Road Eagle, Colorado**	SITE MAP	
	CLIENT: **McDonalds USA**	PROJECT NO: **A25171.01259**	FIGURE NO: **2**

APPENDIX

Site Exploration

The subsurface conditions of the site were explored by drilling five (5) borings to target depths of 10 feet and 25 feet below existing site grades. Early auger refusal was encountered on bedrock at depths ranging from of approximately 5½ to 11 feet below existing site grades in borings B-2, B-3 and B-4. Borings were drilled using a truck-mounted, auger drill rig. Refer to Figure 2 for a boring location map.

Soils were logged during drilling by a graduate geologist, and samples were obtained to aid in material classification and for possible laboratory testing. Boring logs are presented on Plates 1 through 6. Sampling was performed using a standard split spoon sampler ("SPT" in boring logs). The SPT sampler was driven in three 6-inch intervals into the substrata with blows from a 140-pound automatic hammer free-falling 30 inches. Penetration resistance (blow counts) was recorded for each 6-inch drive. Blow counts for the final 12 inches of the total 18 inches are presented as blows per foot in boring logs at the respective depths the samples were taken. Bag/bulk samples ("B" in boring logs) were also collected from the borings for laboratory testing. The soils are generally classified by the Unified Soil Classification System. Plate 7 presents an explanation of material classifications used in this report.

Laboratory Testing

Laboratory testing was performed on selected samples of on-site soils. Tests were performed in general accordance with applicable ASTM or local standards.

Field moisture contents were performed on undisturbed samples. The results of these tests are presented on the boring logs.

Sieve Analyses, Minus 200 and Atterberg Limits (liquid limit and plastic limit) tests, along with the percent passing the No. 200 sieve were performed for selected samples to aid in classification. Test results are presented on Plates 7a through 7c and summarized below.

Sample Location	Material Description	Liquid Limit	Plasticity Index	Passing No. 200
B-1 @ 1-6 ft	Silty SAND with Gravel	NV	NP	27
B-2 @ 2-7 ft	Clayey GRAVEL with Sand	29	9	41
B-4 @ 2-7 ft	GRAVEL with Sand and Clay	20	4	20.3

Chemical tests were performed on a representative sample. The tests were performed to determine the percent chloride, water-soluble sodium, sulfate and sodium sulfate, as well as the soil solubility. Test results are presented on Plates 8a through 8c.

BORING LOG B-1

CLIENT:	BORING LOCATION:	ELEVATION (ft):	PROJECT:	SITE:
McDonalds USA	See site map	N/A	McDonalds 51052 - Eagle, CO	295 Eby Creek Road

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER WITH TIME AND AT OTHER LOCATIONS.

MOISTURE CONTENT %	DRY DENSITY PCF	SAMPLE TYPE*	SAMPLE	BLOWS/FT	DEPTH, FT	USCS SYMBOL	GRAPHIC	SOIL DESCRIPTION	CONSISTENCY
					0	FILL		FILL: 2.5-inches Asphalt FILL: Silty SAND with gravel, slightly moist, reddish brown	
					1				
					2	GM		Silty GRAVEL with sand, slightly moist, reddish brown	Dense
2.6		SPT B		50	3				V. Dense
					4				
					5				
3.8		SPT		86/11"	6				
					7			- partially cemented	
					8				
					9				
					10			- brownish grey	
1.6		SPT		98/8"	11				
								Bottom of Boring at 11.2 feet	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

* SAMPLE TYPE: R = RING B = BAG SPT = STANDARD PENETRATION
DCP = DYNAMIC CONE PENETROMETER

UNIVERSAL ENGINEERING SCIENCES

NOTES:
Groundwater was not encountered within the depth drilled.

DATE DRILLED:	PAGE NO:	PROJECT NO.:	PLATE NO.:
9/2/2025	1 of 1	A25170.01259	1

BORING LOG B-2

CLIENT: McDonalds USA		PROJECT: McDonalds 51052 - Eagle, CO
BORING LOCATION: See site map	ELEVATION (ft): N/A	SITE: 295 Eby Creek Road

MOISTURE CONTENT %	DRY DENSITY PCF	SAMPLE TYPE*	SAMPLE	BLOWS/FT	DEPTH, FT	USCS SYMBOL	GRAPHIC	SOIL DESCRIPTION	CONSISTENCY
					0	FILL		FILL: 2.5-inches Asphalt FILL: Silty GRAVEL with sand, slightly moist, dark brown	
					1				
					2				
						GC		Clayey GRAVEL with sand, slightly moist, dark brown	V. Dense
10.7		SPT		54/11"	3				
								- partially cemented	
		B			4				
					5	GM		Silty GRAVEL with sand, slightly moist, reddish brown to dark brown	
7.3		SPT		58	6				
								- dark brown	
					7				
								- reddish brown	
					8				
4.3		SPT		50/2"	9			- partially cemented Refusal on BEDROCK	
								Bottom of Boring at 9 feet	

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER WITH TIME AND AT OTHER LOCATIONS.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

* SAMPLE TYPE: R = RING B = BAG SPT = STANDARD PENETRATION
DCP = DYNAMIC CONE PENETROMETER

UNIVERSAL ENGINEERING SCIENCES

NOTES:
Groundwater was not encountered within the depth drilled.

DATE DRILLED:	PAGE NO:
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PROJECT NO.:	PLATE NO.:
A25170.01259	2

BORING LOG B-3

CLIENT: McDonalds USA	PROJECT: McDonalds 51052 - Eagle, CO
BORING LOCATION: See site map; ELEVATION (ft): N/A	SITE: 295 Eby Creek Road

MOISTURE CONTENT %	DRY DENSITY PCF	SAMPLE TYPE*	SAMPLE	BLOWS/FT	DEPTH, FT	USCS SYMBOL	GRAPHIC	SOIL DESCRIPTION	CONSISTENCY
					0	FILL		FILL: 3-inches Asphalt FILL: Silty SAND with gravel, slightly moist, dark brown	
					1				
					2			- reddish brown	
3.9		SPT		50/1"	3	GM		Silty GRAVEL with sand, slightly moist, reddish brown to dark brown	V. Dense
3.5		B			4				
4.5		SPT		50/6"	5			- with quartz Refusal on BEDROCK	
								Bottom of Boring at 5.5 feet	

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

* SAMPLE TYPE: R = RING B = BAG SPT = STANDARD PENETRATION
DCP = DYNAMIC CONE PENETROMETER

UNIVERSAL ENGINEERING SCIENCES

NOTES:
Groundwater was not encountered within the depth drilled.

DATE DRILLED:	PAGE NO:
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PROJECT NO.:	PLATE NO.:
A25170.01259	3

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER WITH TIME AND AT OTHER LOCATIONS.

BORING LOG B-4

CLIENT:	PROJECT:
McDonalds USA	McDonalds 51052 - Eagle, CO

BORING LOCATION:	ELEVATION (ft):	SITE:
See site map	N/A	295 Eby Creek Road

MOISTURE CONTENT %	DRY DENSITY PCF	SAMPLE TYPE*	BLOWS/FT	DEPTH, FT	USCS SYMBOL	SOIL DESCRIPTION	CONSISTENCY
				0	FILL	FILL: Approximately 3.0" Asphalt FILL: Silty SAND with gravel, slightly moist, dark brown	
				2		-gravelly	
				2.5	GC/ GM	Silty-Clayey GRAVEL with sand, with quartz, slightly moist, reddish brown to grey	V. Dense
2.8		SPT	50	3			
				4		- partially cemented	
		B		4.5			
3.9		SPT	76	6			
2.3		SPT	50/0"	8.5		- brown	
				11		Refusal on BEDROCK	

Bottom of Boring at 11 feet

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER WITH TIME AND AT OTHER LOCATIONS.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

* SAMPLE TYPE: R = RING B = BAG SPT = STANDARD PENETRATION
DCP = DYNAMIC CONE PENETROMETER

UNIVERSAL ENGINEERING SCIENCES

NOTES:
Groundwater was not encountered within the depth drilled.

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BORING LOG B-5

CLIENT:	PROJECT:
McDonalds USA	McDonalds 51052 - Eagle, CO

BORING LOCATION:	ELEVATION (ft):	SITE:
See site map	N/A	295 Eby Creek Road

MOISTURE CONTENT %	DRY DENSITY PCF	SAMPLE TYPE*	SAMPLE	BLOWS/FT	DEPTH, FT	USCS SYMBOL	GRAPHIC	SOIL DESCRIPTION	CONSISTENCY
					0	FILL		FILL: Approximately 2.5" Asphalt FILL: Silty SAND with gravel, slightly moist, reddish brown	
					1.5	GM		Silty GRAVEL with sand, slightly moist, reddish brown to brown	M. Dense
								- with quartz sandstone	Dense
4.1		SPT		46	3				
					5	ROCK		SANDSTONE, slightly moist, intermittent layers of clay, reddish brown to grey	M. Hard
4.6		SPT		53	5.5				
					10			- brown	
1.9		SPT		56	11				
					11.5			Bottom of Boring at 11.5 feet	

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AT THE TIME OF LOGGING. CONDITIONS MAY DIFFER WITH TIME AND AT OTHER LOCATIONS.

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES: IN-SITU, THE TRANSITION MAY BE GRADUAL.

* SAMPLE TYPE: R = RING B = BAG SPT = STANDARD PENETRATION
DCP = DYNAMIC CONE PENETROMETER

UNIVERSAL ENGINEERING SCIENCES

NOTES:
Groundwater was not encountered within the depth drilled.

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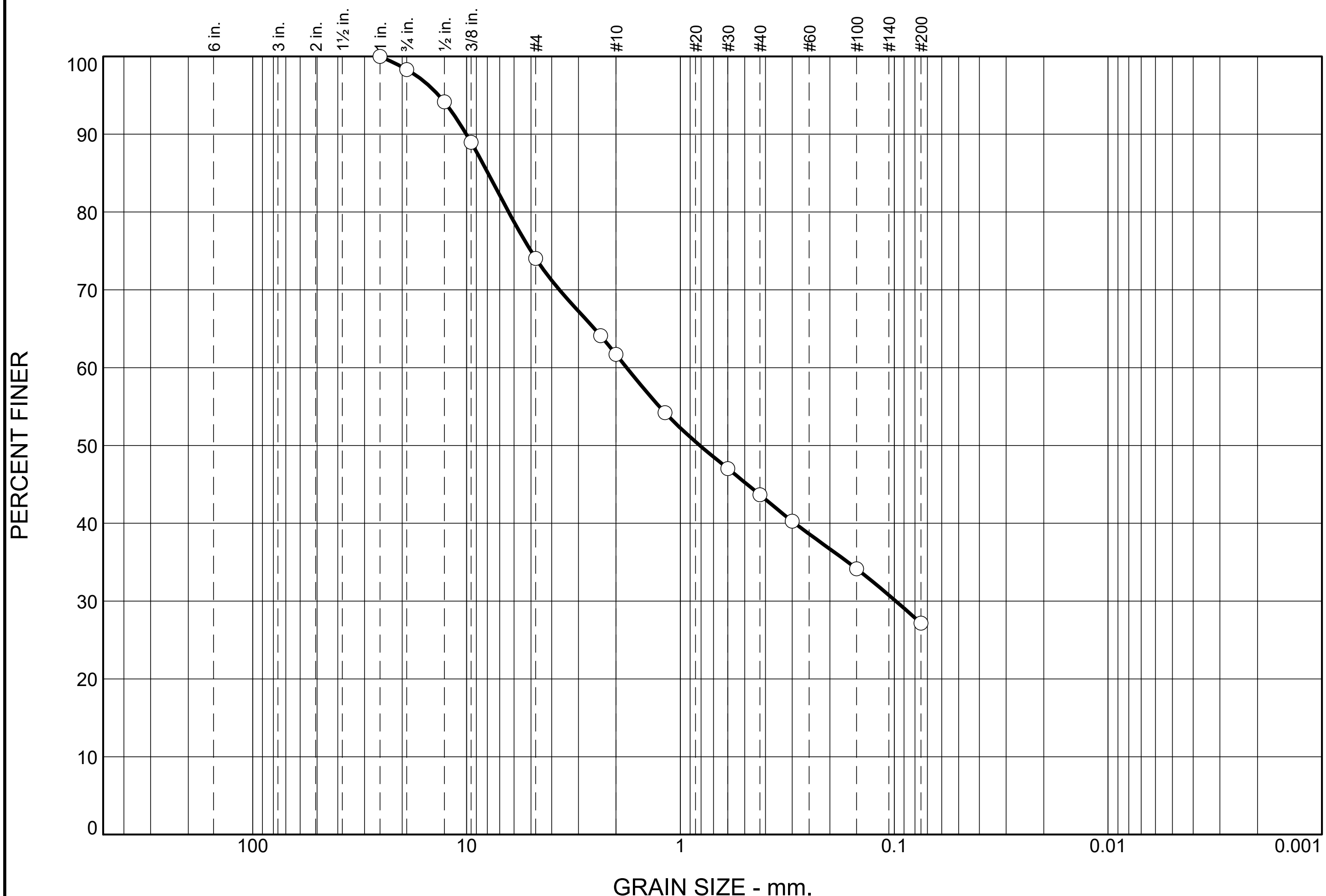
MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - 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

UNVIERSAL ENGINEERING SCIENCES	CLIENT: McDonalds USA	**Materials Classification**	
	PROJECT: McDonalds 51052 Eagle, Colorado	PROJECT NO.: A25170.01259	PLATE NO.: 6

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	1.7	24.3	12.3	18.0	16.5	27.2	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	NV	NP	7.9392	1.7839	0.8111	0.0984				

Material Description	USCS	AASHTO
○ Silty Sand with Gravel	SM	A-2-4(0)

Project No. A25170.01259 **Client:** McDonalds USA

Project: McDonalds 51052 - Eagle, CO

○ **Source of Sample:** B-1 **Depth:** 1-6 ft

Remarks:

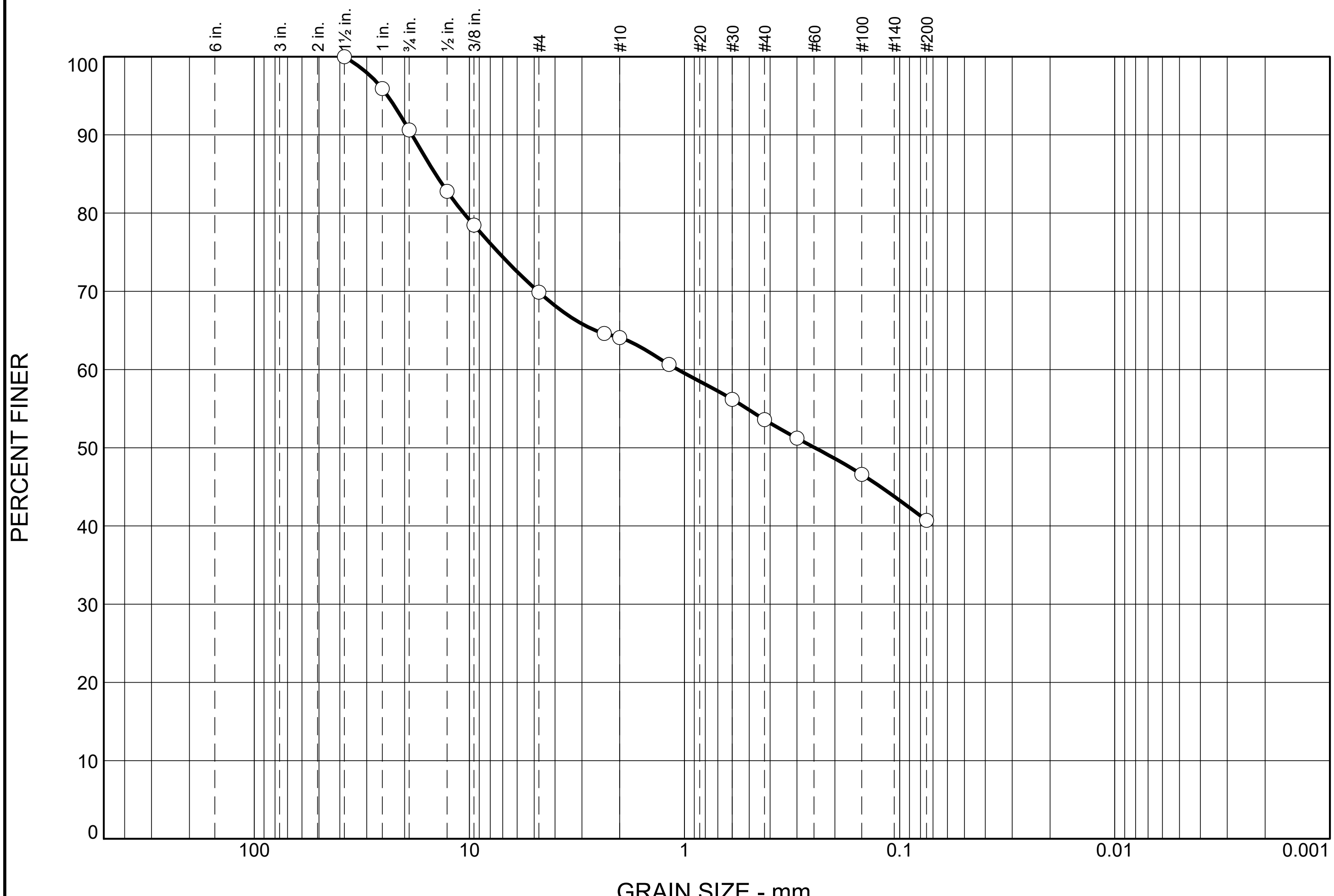
Universal Engineering Sciences

Las Vegas, Nevada

Plate 7a

Tested By: DP **Checked By:** LM

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	9.4	20.7	5.8	10.5	12.9	40.7	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	29	9	14.3666	1.0746	0.2478					

Material Description	USCS	AASHTO
○ Clayey GRAVEL with sand	GC	A-6(3)

Project No. A25170.01259 **Client:** McDonalds USA
Project: McDonalds 51052 - Eagle, CO

○ **Source of Sample:** B-2 **Depth:** 2-7 ft

Remarks:

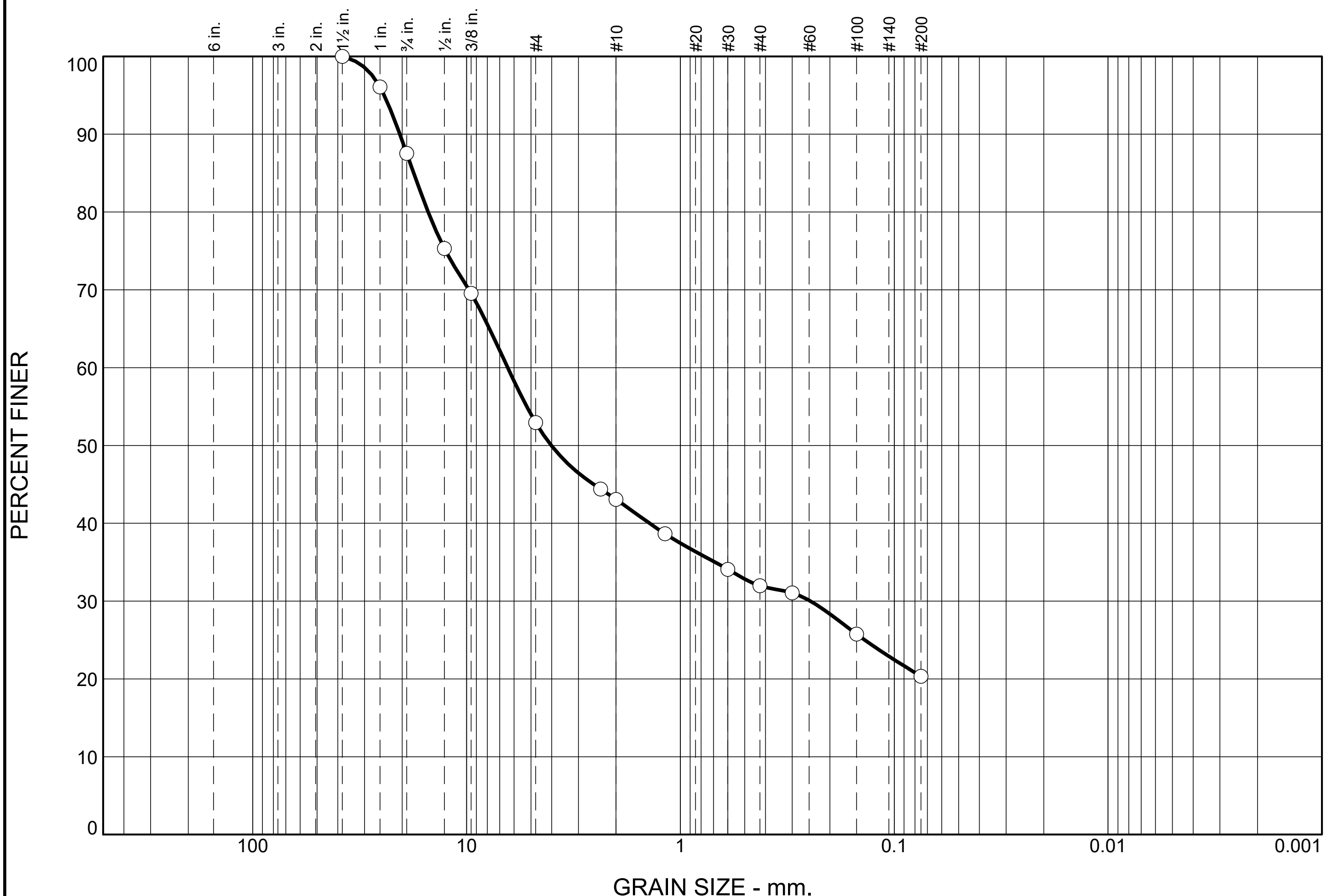
Universal Engineering Sciences

Las Vegas, Nevada

Plate 7b

Tested By: DP **Checked By:** LM

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines	
		Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
○	0.0	12.5	34.6	9.8	11.1	11.7	20.3	

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○	20	16	17.6654	6.4197	4.0123	0.2467				

Material Description	USCS	AASHTO
○ Gravel with Sand and Clay	GC-GM	A-1-b

Project No. A25170.01259 **Client:** McDonalds USA
Project: McDonalds 51052 - Eagle, CO

○ **Source of Sample:** B-4 **Depth:** 2-7 ft

Universal Engineering Sciences

Las Vegas, Nevada

Remarks:

Plate 7c

Tested By: DP **Checked By:** LM

4480 West Hacienda Ave,Suite 104
Las Vegas, NV 89118
(702) 873-3478

SUMMARY OF SOIL AND AGGREGATE TEST RESULTS

CLIENT: 8360 W. Sahara Ave, Suite 110
McDonalds USA
Chicago, IL 60607-2101

REPORT DATE: 9/26/2025
PROJECT: **McDonalds 51052 - Eagle, CO**

PROJECT NO.: **A25170.01259.000**

Tested By: J. Sloan
Sample Loc.: B1 @ 1'-6'
Sample Description:

CHEMICAL LABORATORY TEST RESULTS

Laboratory Test	Results	Spec's.	Pass/Fail
Soluble Sodium, ASTM D2791, %	<0.01		
Soluble Sulfate, 4500 E, %	0.01		
Soluble Sodium Sulfate, AWWA SM3500 & SM 4500 by Calc., %	<0.01		
Solubility, AWWA 2540 C, %	0.31		
Chloride, 4500 CL B, mg/kg	203.2		

Comments:

Reviewed By: John Sloan
For John Sloan
Chemistry Laboratory Director

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CLIENT: 8360 W. Sahara Ave, Suite 110
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REPORT DATE: 9/26/2025
PROJECT: **McDonalds 51052 - Eagle, CO**

PROJECT NO.: **A25170.01259.000**

Tested By: J. Sloan
Sample Loc.: B2 @ 2'-7'
Sample Description:

CHEMICAL LABORATORY TEST RESULTS

Laboratory Test	Results	Spec's.	Pass/Fail
Soluble Sodium, ASTM D2791, %	<0.01		
Soluble Sulfate, 4500 E, %	0.02		
Soluble Sodium Sulfate, AWWA SM3500 & SM 4500 by Calc., %	<0.01		
Solubility, AWWA 2540 C, %	0.25		
Chloride, 4500 CL B, mg/kg	107.7		

Comments:

Reviewed By: John Sloan
For John Sloan
Chemistry Laboratory Director

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McDonalds USA
Chicago, IL 60607-2101

REPORT DATE: 9/26/2025
PROJECT: **McDonalds 51052 - Eagle, CO**

PROJECT NO.: **A25170.01259.000**

Tested By: J. Sloan
Sample Loc.: B3 @ 1'-6'
Sample Description:

CHEMICAL LABORATORY TEST RESULTS

Laboratory Test	Results	Spec's.	Pass/Fail
Soluble Sodium, ASTM D2791, %	<0.01		
Soluble Sulfate, 4500 E, %	0.01		
Soluble Sodium Sulfate, AWWA SM3500 & SM 4500 by Calc., %	<0.01		
Solubility, AWWA 2540 C, %	0.06		
Chloride, 4500 CL B, mg/kg	165.6		

Comments:

Reviewed By: John Sloan
For John Sloan
Chemistry Laboratory Director