



Huddleston-Berry
Engineering & Testing, LLC

**GEOTECHNICAL AND GEOLOGIC HAZARDS
INVESTIGATION
780 26 ½ ROAD
GRAND JUNCTION, COLORADO
PROJECT #02229-0001**

**217 O'CONNOR, LLC
780 26 ½ ROAD
GRAND JUNCTION, COLORADO 81506**

MARCH 19, 2021

**Huddleston-Berry Engineering and Testing, LLC
2789 Riverside Parkway
Grand Junction, Colorado 81501**

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

A geologic hazards and geotechnical investigation was conducted for a proposed subdivision in Grand Junction, Colorado. The project location is shown on Figure 1 – Site Location Map. The purpose of the investigation was to evaluate the surface and subsurface conditions at the site with respect to geologic hazards, pavement design, and earthwork for the proposed development. This summary has been prepared to include the information required by civil engineers, structural engineers, and contractors involved in the project.

Subsurface Conditions (p. 2)

The subsurface investigation consisted of six test pits, excavated on February 19, 2021. The locations of the test pits are shown on Figure 2 – Site Plan. The test pits generally encountered native gravel and cobble soils in the shallow subsurface. However, shallow shale bedrock was encountered in the southeast corner of the site. Groundwater was not encountered in the subsurface at the time of the investigation. The native soils are slightly plastic and are anticipated to be stable. The shale bedrock is moderately plastic and is anticipated to be slightly to moderately expansive.

Geologic Hazards and Constraints (p. 3)

No geologic hazards were identified which would preclude development of this property. However, moisture sensitive bedrock was encountered during the subsurface investigation and these materials may impact the design and construction of foundations, pavements, etc.

Summary of Foundation Recommendations (p. 4)

Based upon the results of site specific geotechnical investigations.

Summary of Pavement Recommendations (p. 5)

Site Access Road and Internal Subdivision Roadways

EDLA = 10, Structural Number = 3.10

ALTERNATIVE	PAVEMENT SECTION (Inches)				
	Hot-Mix Asphalt Pavement	CDOT Class 6 Base Course	CDOT Class 3 Subbase Course	Rigid Pavement	TOTAL
A	3.0	13.0			16.0
B	4.0	10.0			14.0
C	3.0	6.0	10.0		19.0
Full Depth RP		6.0		6.0	12.0

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	Scope.....	1
1.2	Site Location and Description.....	1
1.3	Proposed Construction	1
2.0	GEOLOGIC SETTING	2
2.1	Soils.....	2
2.2	Geology.....	2
2.3	Groundwater	2
3.0	FIELD INVESTIGATION	2
3.1	Subsurface Investigation.....	2
3.2	Field Reconnaissance.....	3
4.0	LABORATORY TESTING.....	3
5.0	GEOLOGIC INTERPRETATION	3
5.1	Geologic Hazards.....	3
5.2	Geologic Constraints.....	3
5.3	Water Resources	3
5.4	Mineral Resources	4
6.0	CONCLUSIONS.....	4
7.0	RECOMMENDATIONS	4
7.1	Foundations.....	4
7.2	Corrosion of Concrete.....	4
7.3	Lateral Earth Pressures	4
7.4	Drainage.....	5
7.5	Excavations	5
7.6	Pavements	5
8.0	GENERAL	6

FIGURES

Figure 1 – Site Location Map

Figure 2 – Site Plan

APPENDICES

Appendix A – UDSA NRCS Soil Survey Data

Appendix B – Typed Test Pit Logs

Appendix C – Laboratory Testing Results

1.0 INTRODUCTION

As part of extensive development in Western Colorado, a new residential subdivision is proposed in Grand Junction. As part of the development process, Huddlestone-Berry Engineering and Testing, LLC (HBET) was retained by 217 O'Connor, LLC to conduct a geologic hazards and geotechnical investigation at the site.

1.1 Scope

As discussed above, a geologic hazards and geotechnical investigation was conducted for the proposed subdivision in Grand Junction, Colorado. The scope of the investigation included the following components:

- Conducting a subsurface investigation to evaluate the subsurface conditions at the site.
- Collecting soil and bedrock samples and conducting laboratory testing to determine the engineering properties of the soils and bedrock at the site.
- Providing preliminary recommendations for foundation type
- Providing recommendations for lateral earth pressure.
- Providing recommendations for pavements.
- Providing recommendations for drainage, grading, and general earthwork.
- Evaluating potential geologic hazards at the site.

The investigation and report were completed by a Colorado registered professional engineer in accordance with generally accepted geotechnical and geological engineering practices. This report has been prepared for the exclusive use of 217 O'Connor, LLC.

1.2 Site Location and Description

The site encompasses approximately 9 acres at 780 26 1/2 Road in Grand Junction, Colorado. The project location is shown on Figure 1 – Site Location Map.

At the time of the investigation, site was fenced with a gradual slight slope down to the south. An existing residence was present in the center of the site. Vegetation primarily consisted of grasses, weeds, and small to large bushes and trees. The site was bordered to the north by the Immaculate Heart of Mary Church, to the west and east by residential properties, and to the south by open land.

1.3 Proposed Construction

The proposed subdivision is anticipated to include subdivision of the property into single-family residential lots. New utilities and internal subdivision roadways will also be included in the development.

2.0 GEOLOGIC SETTING

2.1 Soils

Soils data was obtained from the USDA Natural Resource Conservation Service Web Soil Survey. The data indicates that the soils at the site consist of Blackston very gravelly loam, 5 to 25 percent slopes; Blackston gravelly loam, 2 to 5 percent slopes; Fruita clay loam, 0 to 2 percent slopes; and Fruita clay loam, 2 to 5 percent slopes. Soil survey data is included in Appendix A.

Residential construction in the Blackston soils is described as being not limited to very limited due to slope. However, structure construction in the Fruita soils is indicated to be somewhat limited due to subsidence risk. Road construction in the site soils is indicated to be somewhat limited to very limited due to slope, frost action, low strength, and/or subsidence risk. Excavation in the site soils is indicated to be somewhat limited to very limited due to slope, dust and/or unstable excavation walls. The site soils are indicated to have a moderate potential for frost action, moderate to high risk of corrosion of uncoated steel, and moderate to high risk of corrosion of concrete.

2.2 Geology

According to the *Geologic Map of the Grand Junction Quadrangle, Mesa County, Colorado* (2002), the eastern portion of the site is underlain by pediment deposits, and the western portion of the site is underlain by the Mancos shale formation.

2.3 Groundwater

Groundwater was not encountered in the subsurface at the time of the investigation.

3.0 FIELD INVESTIGATION

3.1 Subsurface Investigation

The subsurface investigation was conducted on February 19th, 2021 and consisted of six test pits, excavated to depths of between 6.0 and 7.5 feet below the existing ground surface. The locations of the test pits are shown on Figure 2 – Site Plan. Typed test pit logs are included in Appendix B. Samples of the subsurface soils were collected using bulk sampling methods at the locations shown on the logs.

As indicated on the logs, the subsurface conditions at the site were slightly variable. Most of the test pits encountered 0.5 feet of topsoil above tan, moist, loose gravels, cobbles, and boulders in a silty clayey sand matrix to the bottoms of the excavations. However, Test Pit TP-4, conducted in the southeast portion of the site, encountered 0.5 feet of topsoil above gray, soft to medium hard, moderately weathered shale bedrock to the bottom of the excavation. Groundwater was not encountered in the subsurface at the time of the investigation.

3.2 Field Reconnaissance

The field reconnaissance included walking the site during the subsurface investigation. In general, the site was very gently sloping. No evidence of active landslides, debris flows, rockfalls, etc. was observed.

4.0 LABORATORY TESTING

Selected soil and bedrock samples collected from the test pits were tested in the Huddleston-Berry Engineering and Testing LLC geotechnical laboratory for natural moisture content, grain-size analysis, and Atterberg limits determination. The laboratory testing results are included in Appendix C.

The laboratory testing results indicate that the native soils are slightly plastic. In general, based upon the presence of gravels, cobbles, and boulders, the native soils are anticipated to be stable under loading.

The shale bedrock was determined to be moderately plastic. Based upon the Atterberg limits of the material our experience with the Mancos shale in the vicinity of the subject site, the shale bedrock at the site is anticipated to be slightly to moderately expansive.

5.0 GEOLOGIC INTERPRETATION

5.1 Geologic Hazards

The primary geologic hazard identified on the site is the presence of moisture sensitive shale bedrock in the shallow subsurface.

5.2 Geologic Constraints

In general, the primary geologic constraint to construction at the site is the presence of moisture sensitive bedrock.

5.3 Water Resources

No water supply wells were observed on the property. As discussed previously, shallow groundwater was not encountered at this site. Therefore, with proper design and construction, the proposed construction is not anticipated to adversely impact surface water or groundwater.

5.4 Mineral Resources

Potential mineral resources in Western Colorado generally include sand, gravel, uranium ore, and commercial rock products such as flagstone. As discussed previously, gravels, cobbles, and boulders were encountered across the site. However, based upon the size of the site and surrounding land use, HBET does not believe that the gravels encountered at the site represent an economically recoverable resource.

6.0 CONCLUSIONS

Based upon the available data sources, field investigation, and nature of the proposed construction, HBET does not believe that there are any geologic conditions which should preclude subdivision of the site. However, foundations, pavements, and earthwork will have to consider the impacts of the moisture sensitive bedrock at the site.

7.0 RECOMMENDATIONS

7.1 Foundations

As discussed previously, the subsurface conditions across the site were slightly variable. In general, shallow foundations will be appropriate where shale bedrock is deeper than 4 feet below the bottom of foundation elevation. However, both shallow and deep foundation alternatives may be considered where the shale is shallow. Due to the variability across the site, HBET recommends that foundation recommendations for individual structures be based upon site specific geotechnical investigations on each lot.

7.2 Corrosion of Concrete

As discussed previously, the USDA Soil Survey data suggests that the native soils have a moderate to high risk of corrosion of concrete. Therefore, at a minimum, Type I-II sulfate resistant cement is recommended for construction at this site.

7.3 Lateral Earth Pressures

Stemwalls or retaining walls should be designed to resist lateral earth pressures. For backfill consisting of the native soils or imported granular, non-free draining, non-expansive material, an active equivalent fluid unit weight of 45 pcf may be used in areas where no surcharge loads are present. An at-rest equivalent fluid unit weight of 65 pcf may be used for braced walls. Lateral earth pressures should be increased as necessary to reflect any surcharge loading behind the walls. Cobble and boulder soils should be screened to 6-inch minus prior to use as backfill behind walls or around foundations. The native bedrock materials should not be used as backfill behind walls or around foundations.

7.4 Drainage

Grading and drainage at the site are critical to the long-term performance of structure foundations and slabs-on-grade. Grading around the structures should be designed to carry precipitation and runoff away from the structures. It is recommended that the finished ground surface drop at least twelve inches within the first ten feet away from the structures. It is recommended that landscaping within five feet of the structures include primarily desert plants with low water requirements. In addition, it is recommended that automatic irrigation, including drip lines, within ten feet of foundations be minimized.

HBET recommends that surface downspout extensions be used which discharge 15 feet from the structures or beyond the backfill zone, whichever is greater. However, if subsurface downspout drains are utilized, they should be carefully constructed of solid-wall PVC and should daylight a minimum of 15-feet from the structures. In addition, an impermeable membrane is recommended below subsurface downspout drain lines. Dry wells should not be used.

7.5 Excavations

Excavations in the soils at the site may stand for short periods of time but should not be considered to be stable. Therefore, trenching and excavations should be sloped back, shored, or shielded for worker protection in accordance with applicable OSHA standards. The native soils at the site generally classify as Type C soil with regard to OSHA's *Construction Standards for Excavations*. For Type C soils, the maximum allowable slope in temporary cuts is 1.5H:1V. For the bedrock materials, vertical cut slopes may be possible. However, HBET should be contacted to evaluate the condition of the bedrock at the time of construction to develop specific recommendations for temporary slopes.

7.6 Pavements

The proposed construction is anticipated to include a new site access road and may include internal subdivision roadways. From the subsurface investigation, the pavement subgrade materials across most of the site consist of gravel, cobble, and boulder soils. However, shale bedrock was present in one of the test pits and this material will be critical for pavement design. As a result, the recommended minimum Resilient Modulus of 3,000 psi was used for the pavement design.

Based upon the subgrade conditions and anticipated traffic loading, asphalt and concrete pavement section alternatives were developed in accordance with AASHTO design procedures. The following minimum pavement section alternatives are recommended:

Site Access Road and Internal Subdivision Roadways

EDLA = 10, Structural Number = 3.10

ALTERNATIVE	PAVEMENT SECTION (Inches)				
	Hot-Mix Asphalt Pavement	CDOT Class 6 Base Course	CDOT Class 3 Subbase Course	Rigid Pavement	TOTAL
A	3.0	13.0			16.0
B	4.0	10.0			14.0
C	3.0	6.0	10.0		19.0
Full Depth RP		6.0		6.0	12.0

Prior to roadway construction, the roadway prism should be stripped of all topsoil, fill, or other unsuitable materials. It is recommended that the subgrade soils be scarified to a depth of 12-inches; moisture conditioned, and recompact to a minimum of 95% of the standard Proctor maximum dry density, within $\pm 2\%$ of optimum moisture as determined by AASHTO T-99. Shale bedrock in the subgrade should be proofrolled to HBET's satisfaction. No moisture should be added to the shale.

Aggregate base course and subbase course should be placed in maximum 9-inch loose lifts, moisture conditioned, and compacted to a minimum of 95% and 93% of the maximum dry density, respectively, at -2% to +3% of optimum moisture content as determined by AASHTO T-180. In addition to density testing, base course should be proofrolled to verify subgrade stability.

It is recommended that Hot-Mix Asphaltic (HMA) pavement conform to CDOT grading SX or S specifications and consist of an approved 75 gyration Superpave method mix design. HMA pavement should be compacted to between 92% and 96% of the maximum theoretical density. An end point stress of 50 psi should be used. It is recommended that rigid pavements consist of CDOT Class P concrete or alternative approved by the Engineer. In addition, pavements should conform to local specifications.

The long-term performance of the pavements is dependent on positive drainage away from the pavements. Ditches, culverts, and inlet structures in the vicinity of paved areas must be maintained to prevent ponding of water on the pavement.

8.0 GENERAL

The recommendations included above are based upon the results of the subsurface investigation and on our local experience. These conclusions and recommendations are valid only for the proposed construction.

As discussed previously, the subsurface conditions at the site were slightly variable. Therefore, the precise nature and extent of any subsurface variability may not become evident until construction. As a result, it is recommended that HBET provide construction materials testing and engineering oversight during the entire construction process.

It is important to note that the recommendations herein are intended to reduce the risk of structural movement and/or damage, to varying degrees, associated with volume change in the subsurface materials. However, HBET cannot predict long-term changes in subsurface moisture conditions and/or the precise magnitude or extent of volume change. Where significant increases in subsurface moisture occur due to poor grading, improper stormwater management, utility line failure, excess irrigation, or other cause, either during construction or the result of actions of the property owners, several inches of movement are possible. In addition, any failure to comply with the recommendations in this report releases Huddlestone-Berry Engineering & Testing, LLC of any liability with regard to the performance of structures, flatwork, etc. at this site.

Huddlestone-Berry Engineering and Testing, LLC is pleased to be of service to your project. Please contact us if you have any questions or comments regarding the contents of this report.

Respectfully Submitted:

Huddlestone-Berry Engineering and Testing, LLC



Michael A. Berry, P.E.
Vice President of Engineering

FIGURES

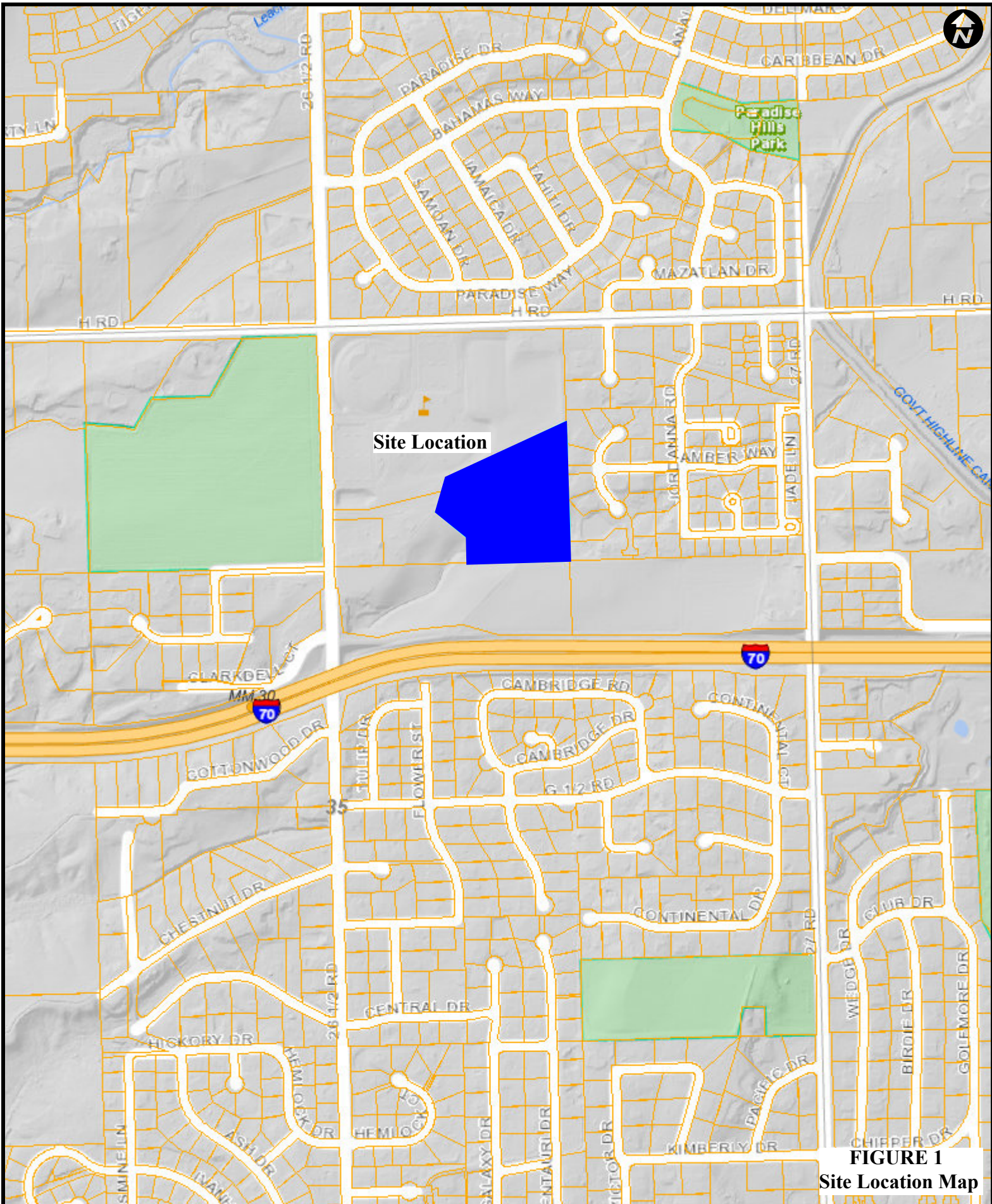
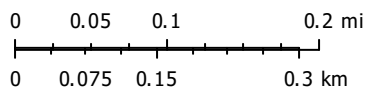


FIGURE 1
Site Location Map

Mesa County Map

The Geographic Information System (GIS) and its components are designed as a source of reference for answering inquiries, for planning and for modeling. GIS is not intended or does not replace legal description information in the chain of title and other information contained in official government records such as the County Clerk and Records office or the courts. In addition, the representations of location in this GIS cannot be substitute for actual legal surveys. The information contained herein is believed accurate and suitable for the limited uses, and subject to the limitations, set forth above. Mesa County makes no warranty as to the accuracy or suitability of any information contained herein. Users assume all risk and responsibility for any and all damages, including consequential damages, which may flow from the user's use of this information.



Print Date: March 12, 2021



Mesa County, Colorado

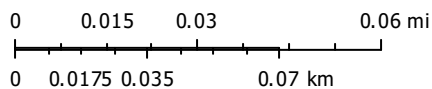
GIS/IT Department
gis.mesacounty.us



FIGURE 2
Site Plan

Mesa County Map

The Geographic Information System (GIS) and its components are designed as a source of reference for answering inquiries, for planning and for modeling. GIS is not intended or does not replace legal description information in the chain of title and other information contained in official government records such as the County Clerk and Records office or the courts. In addition, the representations of location in this GIS cannot be substitute for actual legal surveys. The information contained herein is believed accurate and suitable for the limited uses, and subject to the limitations, set forth above. Mesa County makes no warranty as to the accuracy or suitability of any information contained herein. Users assume all risk and responsibility for any and all damages, including consequential damages, which may flow from the user's use of this information.



Print Date: March 12, 2021

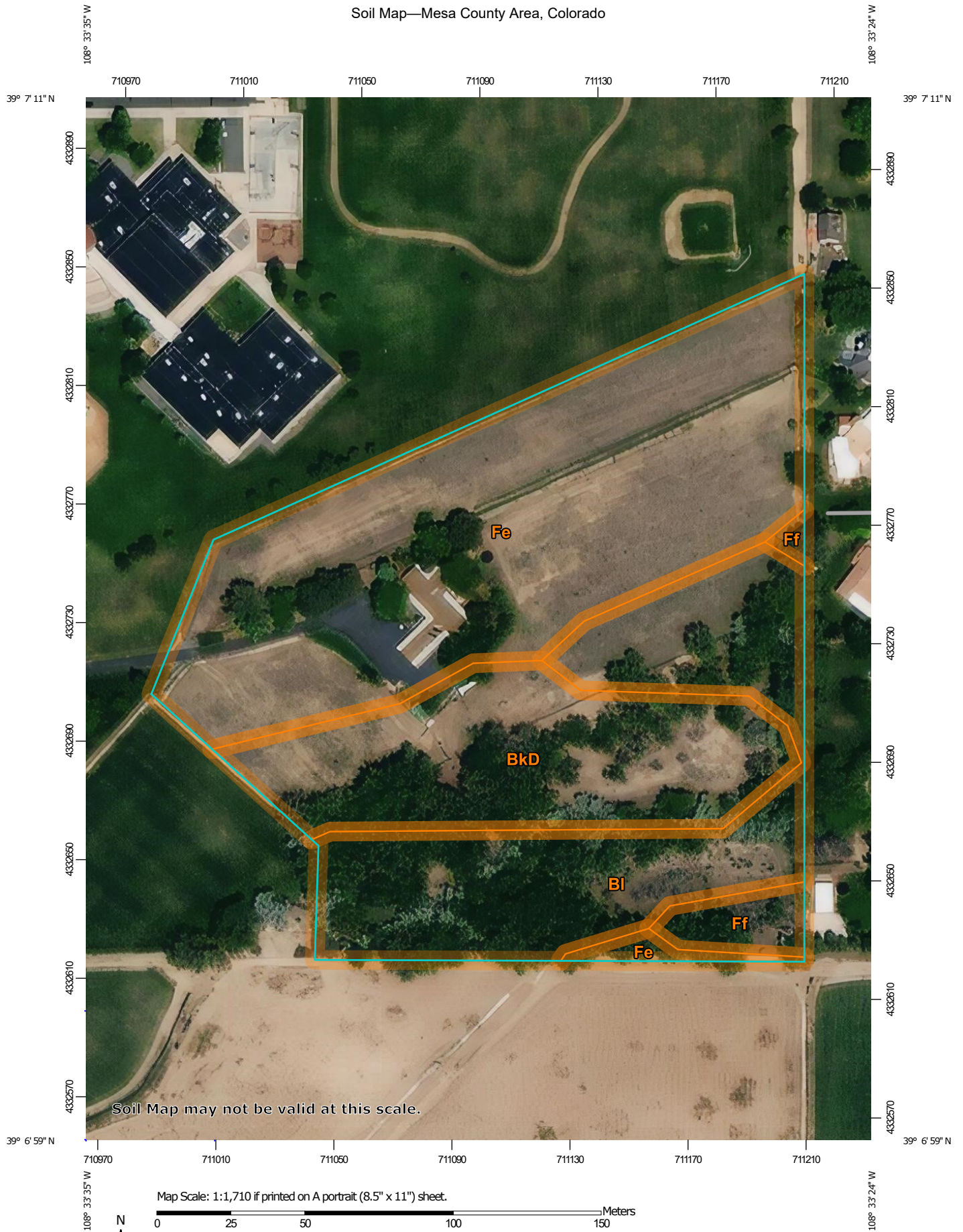


Mesa County, Colorado

GIS/IT Department
gis.mesacounty.us

APPENDIX A
Soil Survey Data

Soil Map—Mesa County Area, Colorado



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

Water Features



Streams and Canals

Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

Background



Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mesa County Area, Colorado

Survey Area Data: Version 11, Jun 8, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 13, 2010—Aug 8, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
BkD	Blackston very gravelly loam, 5 to 25 percent slopes	2.0	22.2%
Bl	Blackston gravelly loam, 2 to 5 percent slopes	2.4	26.4%
Fe	Fruita clay loam, 0 to 2 percent slopes	4.3	48.4%
Ff	Fruita clay loam, 2 to 5 percent slopes	0.3	3.0%
Totals for Area of Interest		9.0	100.0%

Map Unit Description

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named, soils that are similar to the named components, and some minor components that differ in use and management from the major soils.

Most of the soils similar to the major components have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Some minor components, however, have properties and behavior characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other soil reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the soil reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description

Mesa County Area, Colorado

BkD—Blackston very gravelly loam, 5 to 25 percent slopes

Map Unit Setting

National map unit symbol: k0bw

Elevation: 4,490 to 4,900 feet

Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Blackston and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blackston

Setting

Landform: Strath terraces
Landform position (three-dimensional): Riser
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile

A - 0 to 3 inches: very gravelly loam
Bk1 - 3 to 7 inches: gravelly clay loam
Bk2 - 7 to 15 inches: very gravelly sandy clay loam
2Bk3 - 15 to 35 inches: extremely gravelly sandy loam
2C - 35 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 5 to 25 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (1.0 to 4.0 mmhos/cm)
Available water capacity: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R034BY106UT - Desert Loam (Shadscale)
Hydric soil rating: No

BI—Blackston gravelly loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: k0bx
Elevation: 4,490 to 4,900 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Blackston and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blackston

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sandstone and shale

Typical profile

Ap - 0 to 3 inches: gravelly loam
Bk1 - 3 to 7 inches: gravelly clay loam
Bk2 - 7 to 15 inches: very gravelly sandy clay loam
2Bk3 - 15 to 35 inches: extremely gravelly sandy loam
2C - 35 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 35 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Nonsaline to slightly saline (1.0 to 4.0 mmhos/cm)
Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R034BY106UT - Desert Loam (Shadscale)

Hydric soil rating: No

Fe—Fruita clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: k0c3

Elevation: 4,490 to 4,890 feet

Mean annual precipitation: 6 to 9 inches

Mean annual air temperature: 50 to 55 degrees F

Frost-free period: 140 to 180 days

Farmland classification: Prime farmland if irrigated

Map Unit Composition

Fruita and similar soils: 90 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fruita

Setting

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Cretaceous source alluvium derived from sandstone and shale

Typical profile

Ap1 - 0 to 2 inches: clay loam

Ap2 - 2 to 6 inches: clay loam

Btk1 - 6 to 16 inches: clay loam

Btk2 - 16 to 22 inches: clay loam

Btk3 - 22 to 32 inches: loam

Bky - 32 to 60 inches: gypsiferous sandy loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Capacity of the most limiting layer to transmit water

(Ksat): Moderately high (0.21 to 0.71 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None

Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent

Gypsum, maximum content: 50 percent

Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)

Sodium adsorption ratio, maximum: 10.0

Available water capacity: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: C
Ecological site: R034BY106UT - Desert Loam (Shadscale)
Hydric soil rating: No

Ff—Fruita clay loam, 2 to 5 percent slopes

Map Unit Setting

National map unit symbol: k0c4
Elevation: 4,490 to 4,890 feet
Mean annual precipitation: 6 to 9 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Fruita and similar soils: 90 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fruita

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Cretaceous source alluvium derived from sandstone and shale

Typical profile

Ap1 - 0 to 2 inches: clay loam
Ap2 - 2 to 6 inches: clay loam
Btk1 - 6 to 16 inches: clay loam
Btk2 - 16 to 22 inches: clay loam
Btk3 - 22 to 32 inches: loam
Bky - 32 to 60 inches: gypsiferous sandy loam

Properties and qualities

Slope: 2 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.21 to 0.71 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Gypsum, maximum content: 50 percent
Maximum salinity: Slightly saline to strongly saline (4.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 10.0

Available water capacity: High (about 9.1 inches)

Interpretive groups

Land capability classification (irrigated): 4e

Land capability classification (nonirrigated): 7c

Hydrologic Soil Group: C

Ecological site: R034BY106UT - Desert Loam (Shadscale)

Hydric soil rating: No

Data Source Information

Soil Survey Area: Mesa County Area, Colorado

Survey Area Data: Version 11, Jun 8, 2020

Dwellings and Small Commercial Buildings

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect dwellings and small commercial buildings.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Dwellings and Small Commercial Buildings

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Dwellings and Small Commercial Buildings—Mesa County Area, Colorado							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BkD—Blackston very gravelly loam, 5 to 25 percent slopes							
Blackston	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Dwellings and Small Commercial Buildings--Mesa County Area, Colorado							
Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BI--Blackston gravelly loam, 2 to 5 percent slopes							
Blackston	90	Not limited		Not limited		Somewhat limited	
						Slope	0.01
Fe--Fruita clay loam, 0 to 2 percent slopes							
Fruita	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Subsidence risk severe	0.95	Subsidence risk severe	0.95	Subsidence risk severe	0.95
Ff--Fruita clay loam, 2 to 5 percent slopes							
Fruita	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Subsidence risk severe	0.95	Subsidence risk severe	0.95	Subsidence risk severe	0.95
						Slope	0.01

Data Source Information

Soil Survey Area: Mesa County Area, Colorado

Survey Area Data: Version 11, Jun 8, 2020

Roads and Streets, Shallow Excavations, and Lawns and Landscaping

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. This table shows the degree and kind of soil limitations that affect local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Information in this table is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this table. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Report—Roads and Streets, Shallow Excavations, and Lawns and Landscaping

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Roads and Streets, Shallow Excavations, and Lawns and Landscaping—Mesa County Area, Colorado							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
BkD—Blackston very gravelly loam, 5 to 25 percent slopes							
Blackston	90	Very limited		Very limited		Very limited	
		Gravel content	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Frost action	0.50	Dusty	0.19
		Droughty	0.81			Unstable excavation walls	0.02
		Dusty	0.19				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Mesa County Area, Colorado							
Map symbol and soil name	Pct. of map unit	Lawns and landscaping		Local roads and streets		Shallow excavations	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Bl—Blackston gravelly loam, 2 to 5 percent slopes							
Blackston	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Droughty	0.75	Frost action	0.50	Dusty	0.19
		Gravel content	0.39			Unstable excavation walls	0.02
		Dusty	0.19				
Fe—Fruita clay loam, 0 to 2 percent slopes							
Fruita	90	Somewhat limited		Very limited		Somewhat limited	
		Dusty	0.38	Low strength	1.00	Dusty	0.38
				Frost action	0.50	Unstable excavation walls	0.01
				Subsidence risk	0.15		
Ff—Fruita clay loam, 2 to 5 percent slopes							
Fruita	90	Somewhat limited		Very limited		Somewhat limited	
		Dusty	0.38	Low strength	1.00	Dusty	0.38
				Frost action	0.50	Unstable excavation walls	0.01
				Subsidence risk	0.15		

Data Source Information

Soil Survey Area: Mesa County Area, Colorado

Survey Area Data: Version 11, Jun 8, 2020

Soil Features

This table gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage, or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, saturated hydraulic conductivity (Ksat), content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Report—Soil Features

Soil Features—Mesa County Area, Colorado									
Map symbol and soil name	Restrictive Layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		<i>Low-RV-High</i>	<i>Range</i>		<i>Low-High</i>	<i>Low-High</i>			
		<i>In</i>	<i>In</i>		<i>In</i>	<i>In</i>			
BkD—Blackston very gravelly loam, 5 to 25 percent slopes									
Blackston		—	—		0	0	Moderate	Moderate	Moderate
BI—Blackston gravelly loam, 2 to 5 percent slopes									
Blackston		—	—		0	0	Moderate	Moderate	Moderate
Fe—Fruita clay loam, 0 to 2 percent slopes									
Fruita		—	—		0	0	Moderate	High	High
Ff—Fruita clay loam, 2 to 5 percent slopes									
Fruita		—	—		0	0	Moderate	High	High

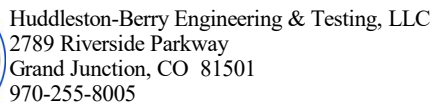
Data Source Information

Soil Survey Area: Mesa County Area, Colorado

Survey Area Data: Version 11, Jun 8, 2020



APPENDIX B
Typed Test Pit Logs



PAGE 1 OF 1

AFTER EXCAVATION ---

GEOTECH BH COLUMNS 02229-0001 780 26.5 ROAD.GPJ GINT US LAB.GDT 3/12/21



Huddlestone-Berry Engineering & Testing, LLC
2789 Riverside Parkway
Grand Junction, CO 81501
970-255-8005

TEST PIT NUMBER TP-2

PAGE 1 OF 1

CLIENT 217 O'Connor, LLC

PROJECT NAME 780 26 1/2 Road

PROJECT NUMBER 02229-0001

PROJECT LOCATION Grand Junction, CO

DATE STARTED 2/19/21 COMPLETED 2/19/21

GROUND ELEVATION TEST PIT SIZE

EXCAVATION CONTRACTOR Hi-River

GROUND WATER LEVELS:

EXCAVATION METHOD Trackh/Backhoe

AT TIME OF EXCAVATION dry

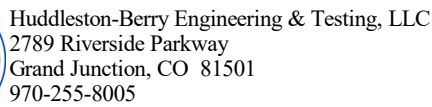
LOGGED BY SD CHECKED BY MAB

AT END OF EXCAVATION dry

NOTES

AFTER EXCAVATION --

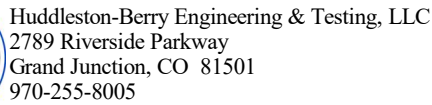
DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Silty Sand with Organics (TOPSOIL)										
		GRAVELS, COBBLES, and BOULDERS in a Silty Clayey SAND matrix (SC-SM), tan, moist, loose										
2.5												
		**Lab Classified GB-1	GB 1					8	23	19	4	24
5.0												
		Bottom of test pit at 7.0 feet.										



PAGE 1 OF 1

AFTER EXCAVATION ---

GEOTECH BH COLUMNS 02229-0001 780 26.5 ROAD.GPJ GINT US LAB.GDT 3/12/21



PAGE 1 OF 1

AFTER EXCAVATION ---



Huddleston-Berry Engineering & Testing, LLC
2789 Riverside Parkway
Grand Junction, CO 81501
970-255-8005

TEST PIT NUMBER TP-5

PAGE 1 OF 1

CLIENT 217 O'Connor, LLC

PROJECT NAME 780 26 1/2 Road

PROJECT NUMBER 02229-0001

PROJECT LOCATION Grand Junction, CO

DATE STARTED 2/19/21 COMPLETED 2/19/21

GROUND ELEVATION TEST PIT SIZE

EXCAVATION CONTRACTOR Hi-River

GROUND WATER LEVELS:

EXCAVATION METHOD Trackh/Backhoe

AT TIME OF EXCAVATION dry

LOGGED BY SD CHECKED BY MAB

AT END OF EXCAVATION dry

NOTES

AFTER EXCAVATION --

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Silty Sand with Organics (TOPSOIL)										
		GRAVELS, COBBLES, and BOULDERS in a Silty Clayey SAND matrix (SC-SM), tan, moist, loose										
2.5												
		**Lab Classified GB-1										
			GB 1					5	23	17	6	32
5.0												
		Bottom of test pit at 6.5 feet.										



Huddlestone-Berry Engineering & Testing, LLC
2789 Riverside Parkway
Grand Junction, CO 81501
970-255-8005

TEST PIT NUMBER TP-6

PAGE 1 OF 1

CLIENT 217 O'Connor, LLC

PROJECT NAME 780 26 1/2 Road

PROJECT NUMBER 02229-0001

PROJECT LOCATION Grand Junction, CO

DATE STARTED 2/19/21 COMPLETED 2/19/21

GROUND ELEVATION TEST PIT SIZE

EXCAVATION CONTRACTOR Hi-River

GROUND WATER LEVELS:

EXCAVATION METHOD Trackh/Backhoe

AT TIME OF EXCAVATION dry

LOGGED BY SD CHECKED BY MAB

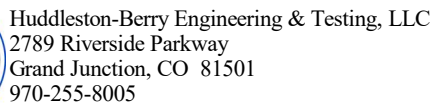
AT END OF EXCAVATION dry

NOTES

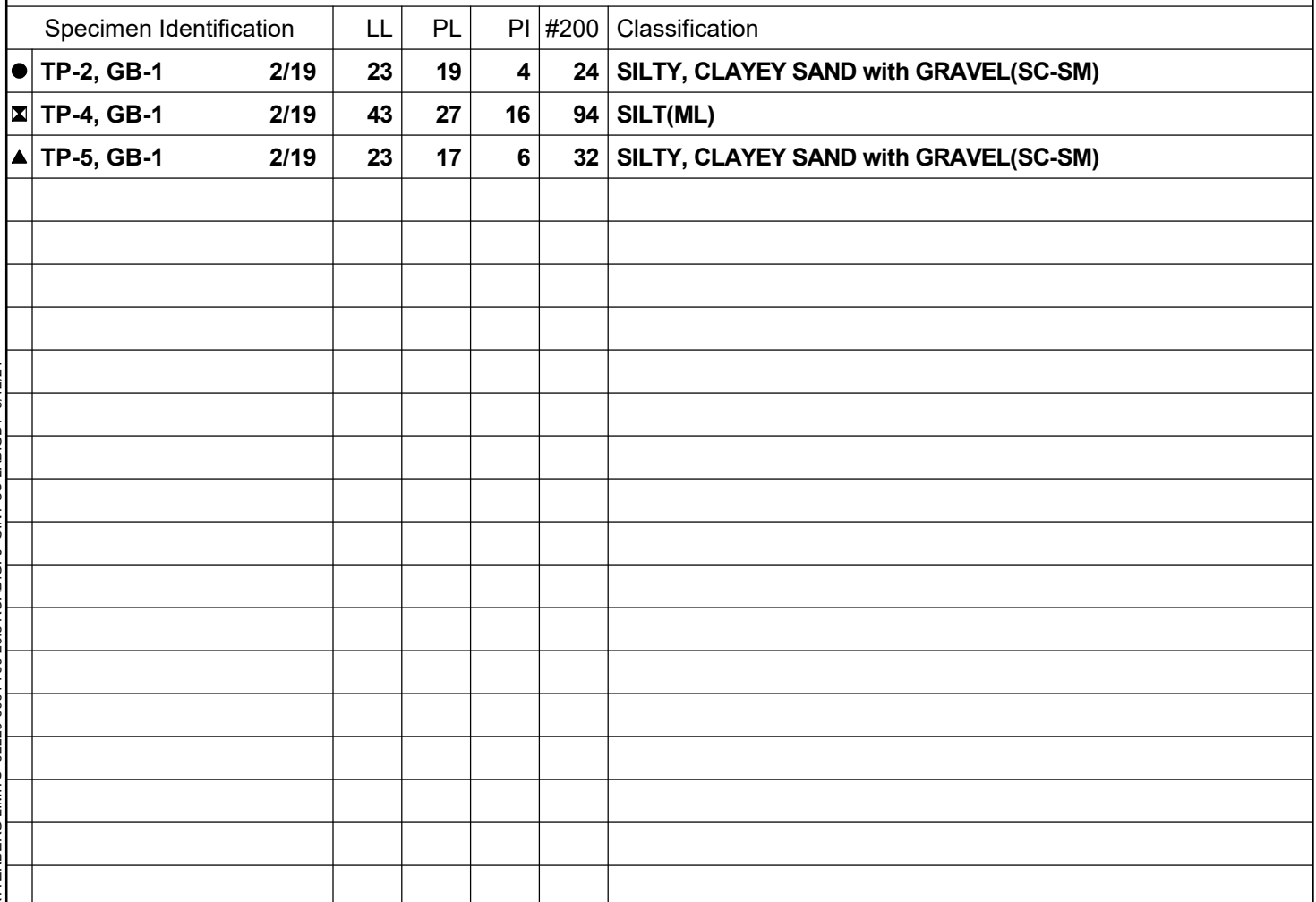
AFTER EXCAVATION --

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES CONTENT (%)
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0.0		Silty Sand with Organics (TOPSOIL)										
2.5		GRAVELS, COBBLES, and BOULDERS in a Silty Clayey SAND matrix (sc-sm), tan, moist, loose										
5.0												
7.5		Bottom of test pit at 7.5 feet.										

APPENDIX C
Laboratory Testing Results



PROJECT LOCATION Grand Junction, CO





Huddlestone-Berry Engineering & Testing, LLC
2789 Riverside Parkway
Grand Junction, CO 81501
970-255-8005

GRAIN SIZE DISTRIBUTION

CLIENT 217 O'Connor, LLC

PROJECT NAME 780 26 1/2 Road

PROJECT NUMBER 02229-0001

PROJECT LOCATION Grand Junction, CO

