



Huddleston-Berry
Engineering & Testing, LLC

**GEOTECHNICAL AND GEOLOGIC HAZARDS
INVESTIGATION
THE TERMINAL
230 S. 5TH STREET
GRAND JUNCTION, COLORADO
PROJECT #02742-0001**

**GRAND JUNCTION DOWNTOWN DEVELOPMENT AUTHORITY
101 S. 3RD STREET, SUITE 100
GRAND JUNCTION, COLORADO 81501**

OCTOBER 17, 2025

**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 The Terminal project 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, foundation design, and earthwork for the proposed construction. 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 borings, drilled on October 11th, 2023. The location of the borings are shown on Figure 2 – Site Plan. The borings encountered native clay and sand soils above dense sandy gravel and cobble soils. Groundwater was encountered in the one of the borings at a depth of 6.0 feet at the time of the investigation. The native clay soils were indicated to be slightly plastic and are anticipated to be slightly collapsible.

Geologic Hazards and Constraints (p. 3)

The primary geologic hazard and constraint at the site is the presence of moisture sensitive soils. In addition, shallow groundwater may impact the proposed construction.

Summary of Foundation Recommendations

- *Foundation Type* - Helical Piles or Shallow Foundations above Geopiers (p. 4)
Helical Piles
 - *Anticipated Length* – 22 to 41 feet. (p. 4)
 - *Axial Capacity* – Dependent upon pile load testing; however, 40 to 60 tons anticipated. (p. 4)
- *Shallow Foundations above Geopiers*
 - *Design Length, Diameter and Spacing* – Determined by Geopier (p. 5)
 - *Allowable Bearing Capacity* – Determined by Geopier (p. 5)
- *Other Design Criteria*
 - *Seismic Design* – Site Class D (p. 5)
 - *Lateral Earth Pressure* – 45 pcf active. 65 pcf at-rest. (p. 5)

TABLE OF CONTENTS

1.0	INTRODUCTION	1
1.1	Scope.....	1
1.2	Site Location and Description.....	1
1.3	Proposed Construction.....	2
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	Seismic Design Criteria.....	5
7.3	Lateral Resistance for Seismic and Wind Loads.....	5
7.4	Corrosion of Concrete and Steel.....	5
7.5	Non-Structural Floor Slabs and Exterior Flatwork.....	6
7.6	Lateral Earth Pressures.....	6
7.7	Drainage.....	7
7.8	Excavations.....	7
8.0	GENERAL	7

FIGURES

Figure 1 – Site Location Map

Figure 2 – Site Plan

APPENDICES

Appendix A – UDSA NRCS Soil Survey Data

Appendix B – Typed Boring Logs

Appendix C – Laboratory Testing Results

1.0 INTRODUCTION

As part of the continued development in Western Colorado, The Terminal project is proposed at 230 S 5th Street in Grand Junction. As part of the development process, Huddlestone-Berry Engineering and Testing, LLC (HBET) was retained by the Grand Junction Downtown Development Authority 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 230 S 5th Street 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 samples and conducting laboratory testing to determine the engineering properties of the soils at the site.
- Providing recommendations for foundation type and subgrade preparation.
- Providing recommendations for bearing capacity.
- Providing recommendations for lateral earth pressure.
- Providing recommendations for drainage, grading, and general earthwork.
- Providing recommendations for pavements.
- 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 the Grand Junction Downtown Development Authority.

1.2 Site Location and Description

The site encompasses approximately 0.4 acres at 230 S 5th Street and 0.1 acres north of 230 S 5th Street in Grand Junction, Colorado. The project location is shown on Figure 1 – Site Location Map.

At the time of the investigation, the northern and southern portions of the site were occupied by a vacant parcel and a former bus terminal, respectively. The vacant parcel served as a gravel parking area and the bus terminal consisted of an abandoned commercial building and covered parking area. An existing alley separated the northern and southern portions of the site. Topography at the site was fairly flat and vegetation was mostly absent. The site was bordered to the north by Colorado Avenue, to the west by S 5th Street and a commercial property, to the east by commercial properties, and to the south by Ute Street.

1.3 Proposed Construction

The proposed construction is anticipated to include the razing and removal of the existing bus terminal and construction of new multi-story buildings.

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 Sagers-Urban land complex, 0 to 2 percent slopes. Soil survey data, including descriptions of the soil units, is included in Appendix A.

Structure construction in the site soils is described as being somewhat limited due to shrink-swell. The site soils are indicated to have a moderate potential for frost action, moderate risk of corrosion of uncoated steel, and moderate risk of corrosion of concrete.

2.2 Geology

According to the *Geologic Map of the Grand Junction Quadrangle* (2002), the site is underlain alluvium and colluvium deposits.

2.3 Groundwater

Groundwater was encountered in Boring B-4, conducted in the center portion of 230 S 5th Street, at a depth of 6.0 feet at the time of the investigation. However, groundwater was not encountered in B-1, B-2, B-4, B-5, or B-6 at the time of the investigation.

3.0 FIELD INVESTIGATION

3.1 Subsurface Investigation

The subsurface investigation was conducted on October 11th, 2023 and consisted of six borings as shown on Figure 2 – Site Plan. The borings were drilled to depths ranging from 22.0 to 28.0 feet below the existing ground surface. Typed boring logs are included in Appendix B. Samples of the native soils were collected using driven sample tubes and/or bulk sampling methods at the locations shown on the logs.

As indicated on the logs, the subsurface conditions at the site were slightly variable. However, the borings generally encountered a thin layer of gravel, asphalt, or concrete above brown to black, moist to wet, soft to stiff lean clay with sand soils to depths of between 17.5 and 26.0 feet. In B-1, B-4, B-5, and B-6, the clay was underlain by gray, moist to wet, loose to medium dense silty sand soils to depths of between 18.5 and 21.0 feet.

Below the clay in B-2 and B-3, and below the sand in the remaining borings, gray, moist to wet, dense sandy gravel and cobbles extended to the bottoms of the borings. As discussed previously, groundwater was encountered in B-4 at a depth of 6.0 feet. However, groundwater was not encountered in the remaining borings.

3.2 Field Reconnaissance

The field reconnaissance included walking the site during the subsurface investigation. In general, the site was fairly level and no evidence of active landslides, debris flows, rockfalls, etc. was observed.

4.0 LABORATORY TESTING

Selected native soil samples collected from the borings were tested in the Huddlestone-Berry Engineering and Testing LLC geotechnical laboratory for natural moisture content determination, grain size analysis, maximum dry density and optimum moisture content (Proctor) determination, and Atterberg limits determination. The laboratory testing results are included in Appendix C.

The laboratory testing results indicate that the native clay soils are slightly plastic. Based upon the Atterberg limits of the material and upon our experience with similar soils in the vicinity of the subject site, the native clay soils are anticipated to be slightly collapsible.

The native sandy gravel, cobble, and boulder soils are anticipated to be non-plastic. In general, based upon our experience with similar soils in the vicinity of the subject site, the native sandy gravel, cobble, and boulder soils are anticipated to be fairly stable under loading.

5.0 GEOLOGIC INTERPRETATION

5.1 Geologic Hazards

The primary geologic hazard at the site is the presence of moisture sensitive soils.

5.2 Geologic Constraints

The primary geologic constraint to construction at the site is the presence of moisture sensitive soils. However, shallow groundwater may also impact the design and construction.

5.3 Water Resources

No water supply wells were observed on the property. However, as discussed previously, shallow groundwater was encountered at the site. In general, 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 gravel, uranium ore, and commercial rock products such as flagstone. As discussed previously, gravels were encountered in the subsurface at the site. However, based upon the size of the site and surrounding land use, HBET does not believe that the gravels 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 construction at the site. However, the presence of moisture sensitive soils may impact the design and construction. In addition, shallow groundwater may impact the design and/or construction.

7.0 RECOMMENDATIONS

7.1 Foundations

Based upon the results of the subsurface investigation and nature of the proposed construction the recommended foundation alternatives include helical piles or shallow foundations above Geopiers. The alternatives are discussed in below.

Helical Piles

Helical piles consist of circular or square steel shafts with load carrying helices attached to them. Some of these types of piers are proprietary. In general, the precise type, size, and quantity of piles should be established by the contractor in conjunction with the structural engineer. However, HBET provides the following design comments.

In general, helical piles should be designed to penetrate the upper clay and sand soils and bear into the dense gravel and cobble soils. To eliminate reductions in capacity from group effects, the piles should be spaced a distance equal to three times the diameter of the largest helix. It is anticipated that the helical piles will reach refusal within 3 to 15 feet of the top of the gravel and cobble soils. Therefore, pile lengths of up to approximately 41 feet may be possible.

Based upon our experience with other projects utilizing helical piles, allowable axial capacities of between approximately 40 and 60 tons are anticipated for piles with a minimum shaft diameter of 4-inches. However, higher capacities are possible depending on the specific pile type/size proposed. The actual allowable capacity should be determined based upon the results of pile load testing conducted on the project site prior to final design. Where necessary, piles battered up to 15° should be utilized to carry lateral loads.

Shallow Foundations above Geopiers

Rammed aggregate piers such as Geopiers are a ground improvement method which increases the bearing capacity of the soils to provide support for shallow foundations. While Geopiers are an acceptable alternative at this site, they are a proprietary system and all design and construction criteria should be developed by Geopier.

7.2 Seismic Design Criteria

In general, based upon the result of the subsurface investigation, the site classifies as Site Class D in accordance with the International Building Code (IBC).

7.3 Lateral Resistance for Seismic and Wind Loads

As discussed above, the native clay and sand soils are soft through most of the profile and are anticipated to provide limited lateral capacity for deep foundations. Based upon the results of the subsurface investigation, the following soil parameters are recommended for use in lateral pile capacity analyses:

Soil Type	Soft Clay
Density (pci)	0.0637
Cohesion (psi)	2
Friction Angle (ϕ)	0
ϵ_{50} (in/in)	0.02
K (pci)	30

In addition to lateral resistance of the piles, lateral resistance can be developed from sliding friction between the floor slab and the ground. In general, for the native soils, a sliding friction angle of 18° is recommended. This corresponds to a friction factor of 0.32.

7.4 Corrosion of Concrete and Steel

As discussed previously, the USDA Soil Survey Data indicates that the site soils have a moderate potential for corrosion of concrete. Therefore, at a minimum, Type I-II sulfate resistant cement is recommended for construction at this site.

The Soil Survey Data also indicates that the site soils have a moderate potential for corrosion of uncoated steel. Based upon our experience with similar soils in the vicinity of the subject site, HBET believes that the native soils have a resistivity of less than 1,000 ohm-cm. Pile design should consider corrosion in their design based upon these resistivity values either through galvanization or accounting for section loss.

7.5 Non-Structural Floor Slabs and Exterior Flatwork

To help limit the potential for excessive movement of non-structural floor slabs, it is recommended that non-structural floor slabs be constructed above a minimum of 24-inches of structural fill with subgrade preparation and fill placement in accordance with the *Shallow Foundations* section of this report. It is recommended that exterior flatwork be constructed above a minimum of 12-inches of structural fill.

The native clay soils are suitable for reuse as structural fill. Imported structural fill should consist of a granular, non-expansive, ***non-free draining*** material with greater than 10% passing the #200 sieve and Liquid Limit of less than 30. However, all proposed imported structural fill materials should be approved by HBET.

Prior to placement of structural fill, it is recommended that the bottoms of the excavations be scarified to a depth of 6 to 8-inches, moisture conditioned, and re-compacted to a minimum of 95% of the standard Proctor maximum dry density, within $\pm 2\%$ of the optimum moisture content as determined in accordance with ASTM D698. However, as discussed previously, soft / loose soils were encountered in the subsurface and this may make compaction of the subgrade difficult. It may be necessary to utilize geotextile and/or geogrid in conjunction with up to 30-inches of additional granular fill to stabilize the subgrade. HBET should be contacted to provide specific recommendations for subgrade stabilization depending upon the actual conditions encountered during construction.

Structural fill should be moisture conditioned, placed in maximum 8-inch loose lifts, and compacted to a minimum of 95% of the standard Proctor maximum dry density for fine grained soils or modified Proctor maximum dry density for coarse grained soils, within $\pm 2\%$ of the optimum moisture content as determined in accordance with ASTM D698 or D1557C, respectively.

7.6 Lateral Earth Pressures

Stemwalls and/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, we recommend that the walls be designed for an active equivalent fluid unit weight of 45 pcf in areas where no surcharge loads are present. An at-rest equivalent fluid unit weight of 65 pcf is recommended for braced walls. Lateral earth pressures should be increased as necessary to reflect any surcharge loading behind the walls.

7.7 Drainage

Due to the presence of moisture sensitive soils at the site, proper site grading is critical to the performance of the structures. In order to improve the long-term performance of the 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 structure. However, where impermeable surfaces (i.e. pavements, sidewalks, etc.) are adjacent to the structures, the grade can be reduced to approximately 2.5-inches (ADA grade) within the first ten feet away from the structures.

HBET recommends that downspout extensions be used which discharge a minimum of 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 or into storm drains. In addition, an impermeable membrane is recommended below subsurface downspout drains. Dry wells should not be used.

If below grade construction is proposed, perimeter foundation drains are recommended. In general, the perimeter foundation drains should consist of prefabricated drain materials or a perforated pipe and gravel with the flowlines of the drains at the bottoms of the foundations (at the highest point). The prefabricated drain materials or gravel should extend along basement walls to within 36-inches of the finished grade. The perimeter drain should slope at a minimum of 1.0% to sumps with pumps.

7.8 Excavations

Excavations in the soils at the site may stand for short periods of time but should not be considered to be stable. Trenching and excavations should be sloped back, shored, or shielded for worker protection in accordance with applicable OSHA standards. The soils 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.

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. However, 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, special inspections, 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 of the native soils. 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 shallow 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 owner, 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 structure performance.

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

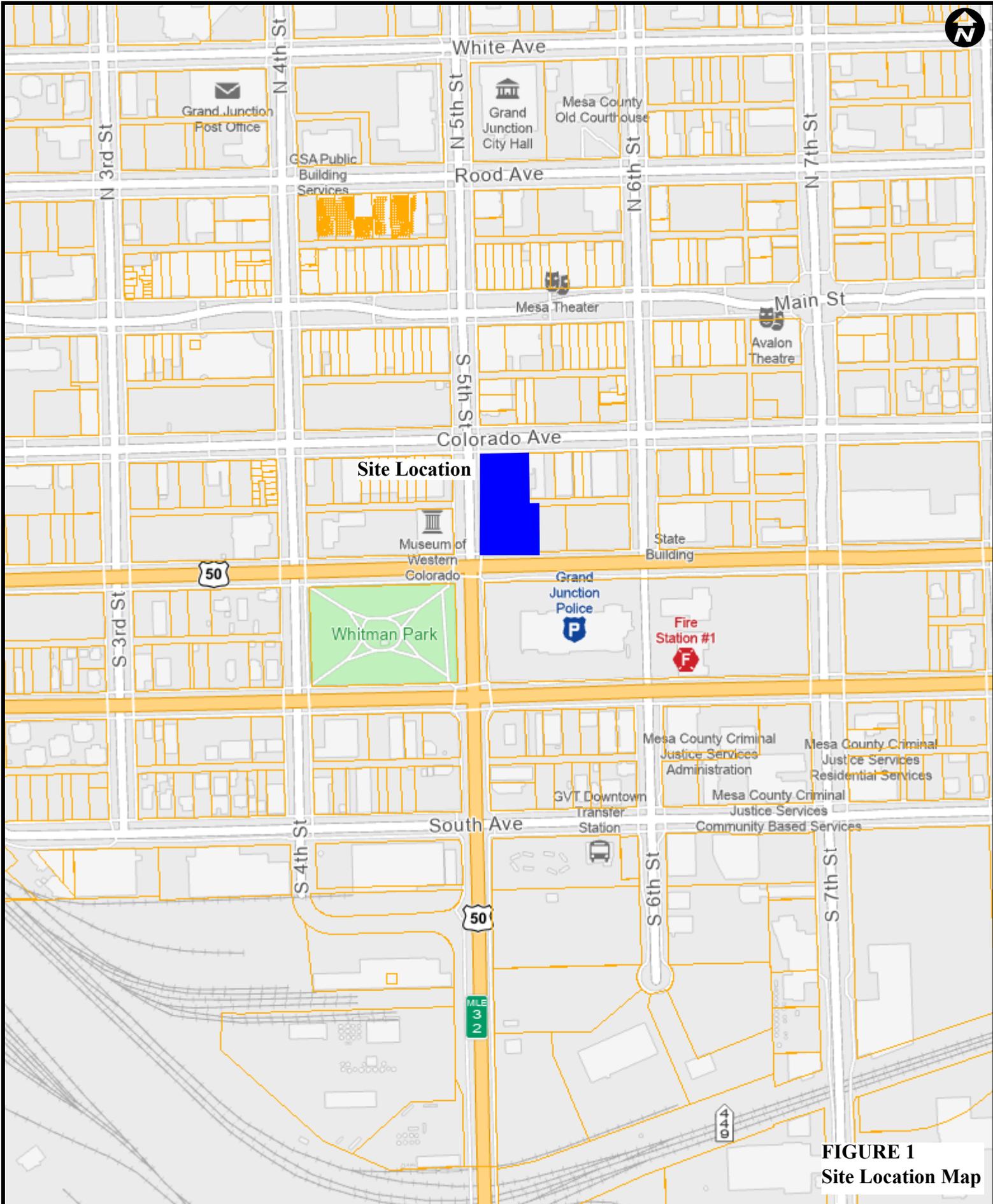
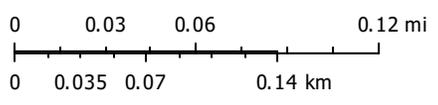


FIGURE 1
Site Location Map

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: November 2, 2023



Mesa County, Colorado

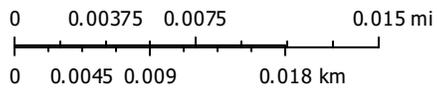
GIS/IT Department
gis.mesacounty.us



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 substituted 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: November 2, 2023

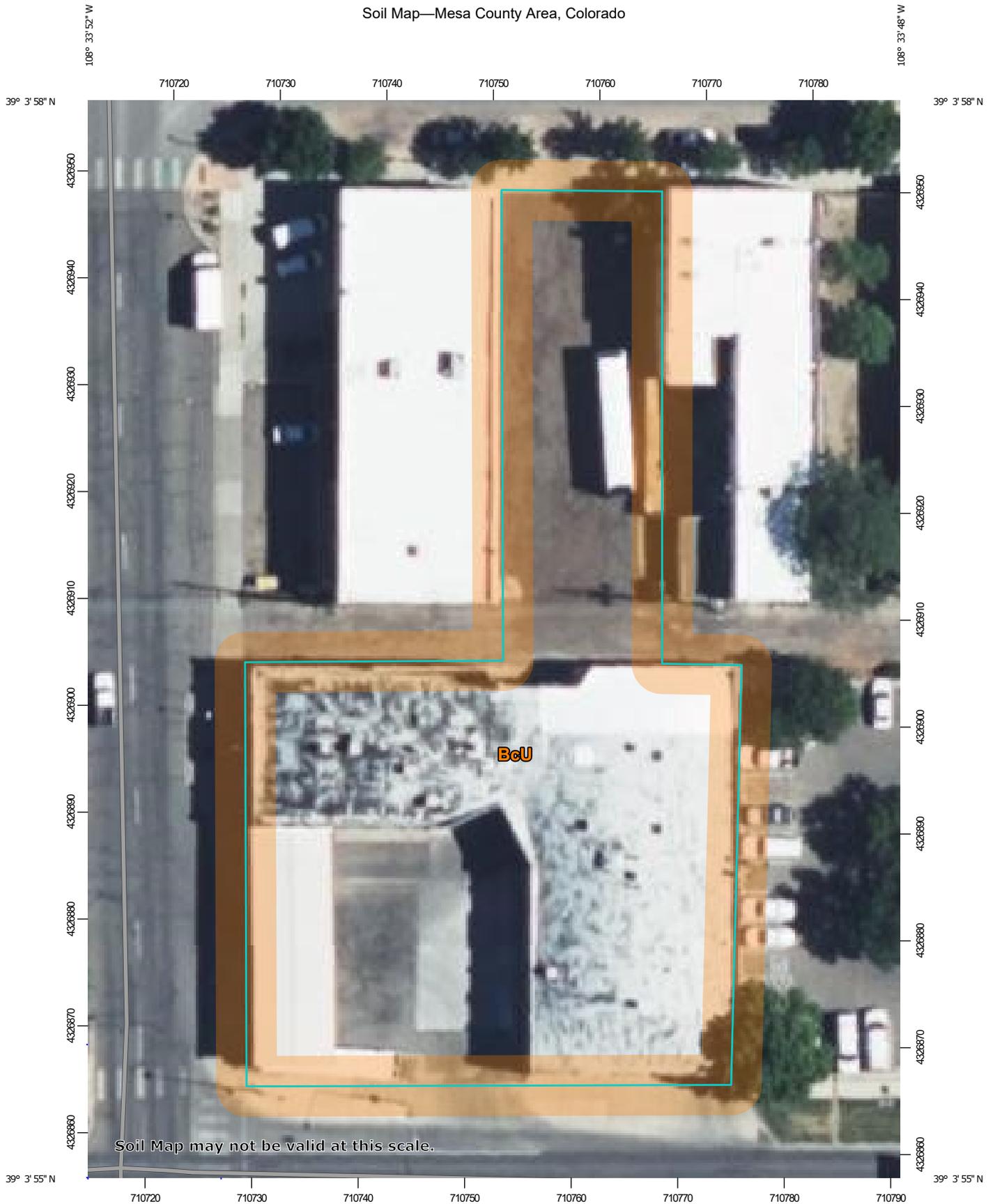


Mesa County, Colorado

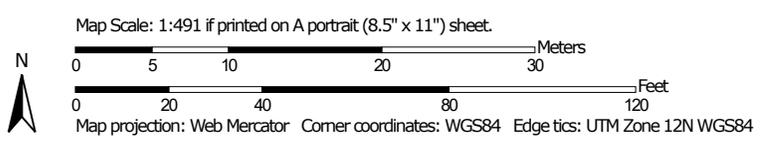
GIS/IT Department
gis.mesacounty.us

APPENDIX A
Soil Survey Data

Soil Map—Mesa County Area, Colorado



Soil Map may not be valid at this scale.



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 14, Aug 22, 2023

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

Date(s) aerial images were photographed: Jun 24, 2020—Jul 8, 2020

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
BcU	Sagers-Urban land complex, 0 to 2 percent slopes	0.6	100.0%
Totals for Area of Interest		0.6	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

BcU—Sagers-Urban land complex, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: k1rq

Elevation: 4,490 to 4,920 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

Sagers and similar soils: 55 percent
Urban land: 40 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Sagers

Setting

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

Typical profile

Ap - 0 to 12 inches: silty clay loam
C - 12 to 25 inches: silty clay loam
Cy - 25 to 60 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 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: 15 percent
Gypsum, maximum content: 5 percent
Maximum salinity: Very slightly saline to moderately saline (2.0 to 8.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 9.7 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

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8

Hydric soil rating: No

Data Source Information

Soil Survey Area: Mesa County Area, Colorado

Survey Area Data: Version 14, Aug 22, 2023

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
BcU—Sagers-Urban land complex, 0 to 2 percent slopes							
Sagers	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.03	Shrink-swell	0.03	Shrink-swell	0.03
Urban land	40	Not rated		Not rated		Not rated	

Data Source Information

Soil Survey Area: Mesa County Area, Colorado
Survey Area Data: Version 14, Aug 22, 2023

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>			
BcU—Sagers-Urban land complex, 0 to 2 percent slopes									
Sagers		—	—		0	0	Moderate	Moderate	Moderate
Urban land		—	—		—	—			

Data Source Information

Soil Survey Area: Mesa County Area, Colorado
 Survey Area Data: Version 14, Aug 22, 2023

APPENDIX B
Typed Boring Logs



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

BORING NUMBER B-1

PAGE 1 OF 1

CLIENT <u>Grand Junction Downtown Development Authority</u>	PROJECT NAME <u>The Terminal</u>	
PROJECT NUMBER <u>02742-0001</u>	PROJECT LOCATION <u>Grand Junction, CO</u>	
DATE STARTED <u>10/11/23</u> COMPLETED <u>10/11/23</u>	GROUND ELEVATION _____ HOLE SIZE <u>4-Inch</u>	
DRILLING CONTRACTOR <u>S. McCracken</u>	GROUND WATER LEVELS:	
DRILLING METHOD <u>Simco 2000 Truck Rig</u>		AT TIME OF DRILLING <u>Dry</u>
LOGGED BY <u>TC</u> CHECKED BY <u>MAB</u>		AT END OF DRILLING <u>Dry</u>
NOTES _____	AFTER DRILLING <u>--</u>	

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		Gravel Base Course										
0 - 18		Lean CLAY with Sand (cl), brown, moist, soft to stiff	SS 1	67	3-2-2 (4)							
5												
10		**Abundant Sulfates Observed	SS 2	83	5-5-7 (12)							
15			SS 3	78	6-6-9 (15)							
18 - 20		Silty SAND (sm), gray, moist, loose **Petroleum Odor	SS 4	100	2-3-3 (6)							
20 - 27		Sandy GRAVELS and COBBLES (blgrcbb), gray, moist, dense										
27		Bottom of hole at 27.0 feet.										

GEOTECH B COLUMNS 02742-0001 THE TERMINAL PROJECT.GPJ GINT US LAB.GDT 11/6/23



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

BORING NUMBER B-2

PAGE 1 OF 1

CLIENT <u>Grand Junction Downtown Development Authority</u>	PROJECT NAME <u>The Terminal</u>
PROJECT NUMBER <u>02742-0001</u>	PROJECT LOCATION <u>Grand Junction, CO</u>
DATE STARTED <u>10/11/23</u> COMPLETED <u>10/11/23</u>	GROUND ELEVATION _____ HOLE SIZE <u>4-Inch</u>
DRILLING CONTRACTOR <u>S. McCracken</u>	GROUND WATER LEVELS:
DRILLING METHOD <u>Simco 2000 Truck Rig</u>	AT TIME OF DRILLING <u>Dry</u>
LOGGED BY <u>TC</u> CHECKED BY <u>MAB</u>	AT END OF DRILLING <u>Dry</u>
NOTES _____	AFTER DRILLING <u>--</u>

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		Gravel Base Course										
0 - 25		Lean CLAY with Sand (cl), brown, moist, soft to stiff	SS 1	78	2-2-1 (3)							
5												
10			SS 2	100	3-3-4 (7)							
15			SS 3	89	4-4-6 (10)							
20			SS 4	67	3-0-1 (1)							
25		Sandy GRAVELS and COBBLES (bldrccb), gray, moist, dense										
		Bottom of hole at 27.0 feet.										

GEOTECH B COLUMNS 02742-0001 THE TERMINAL PROJECT.GPJ GINT US LAB.GDT 11/6/23



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

BORING NUMBER B-3

PAGE 1 OF 1

CLIENT <u>Grand Junction Downtown Development Authority</u>	PROJECT NAME <u>The Terminal</u>	
PROJECT NUMBER <u>02742-0001</u>	PROJECT LOCATION <u>Grand Junction, CO</u>	
DATE STARTED <u>10/11/23</u> COMPLETED <u>10/11/23</u>	GROUND ELEVATION _____ HOLE SIZE <u>4-Inch</u>	
DRILLING CONTRACTOR <u>S. McCracken</u>	GROUND WATER LEVELS:	
DRILLING METHOD <u>Simco 2000 Truck Rig</u>		AT TIME OF DRILLING <u>Dry</u>
LOGGED BY <u>TC</u> CHECKED BY <u>MAB</u>		AT END OF DRILLING <u>Dry</u>
NOTES _____	AFTER DRILLING <u>--</u>	

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		Gravel Base Course										
		Lean CLAY with Sand (cl), brown, moist, medium stiff to very soft										
		**Abundant Sulfates Observed	SS 1	50	4-3-4 (7)							
5												
			SS 2	100	2-2-3 (5)							
10												
			SS 3	100	3-6-8 (14)							
15												
			SS 4	100	1-0-0 (0)							
20												
25												
		Sandy GRAVELS and COBBLES (blsrcbbl), gray, moist, dense										
		Bottom of hole at 28.0 feet.										

GEOTECH BOLUMNS 02742-0001 THE TERMINAL PROJECT.GPJ GINT US LAB.GDT 11/6/23



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

BORING NUMBER B-4

PAGE 1 OF 1

CLIENT <u>Grand Junction Downtown Development Authority</u>	PROJECT NAME <u>The Terminal</u>
PROJECT NUMBER <u>02742-0001</u>	PROJECT LOCATION <u>Grand Junction, CO</u>
DATE STARTED <u>10/11/23</u> COMPLETED <u>10/11/23</u>	GROUND ELEVATION _____ HOLE SIZE <u>4-Inch</u>
DRILLING CONTRACTOR <u>S. McCracken</u>	GROUND WATER LEVELS: ∇ AT TIME OF DRILLING <u>6.0 ft</u> ▼ AT END OF DRILLING <u>6.0 ft</u>
DRILLING METHOD <u>Simco 2000 Truck Rig</u>	
LOGGED BY <u>TC</u> CHECKED BY <u>MAB</u>	AFTER DRILLING <u>--</u>
NOTES _____	

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		CONCRETE										
		Lean CLAY with Sand (cl), brown and gray to black, moist to wet, soft to medium stiff										
5			SS 1	89	1-1-1 (2)							
10			SS 2	100	0-2-2 (4)							
15		**Petroleum Odor	SS 3	83	2-4-4 (8)							
20		Silty SAND (sm), gray, wet, loose **Petroleum Odor	SS 4	89	5-4-2 (6)							
		Sandy GRAVELS and COBBLES (blgrcbbl), gray, wet, dense										
		Bottom of hole at 22.0 feet.										

GEOTECH BH COLUMNS 02742-0001 THE TERMINAL PROJECT.GPJ GINT US LAB.GDT 11/6/23



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

BORING NUMBER B-5

PAGE 1 OF 1

CLIENT <u>Grand Junction Downtown Development Authority</u>	PROJECT NAME <u>The Terminal</u>	
PROJECT NUMBER <u>02742-0001</u>	PROJECT LOCATION <u>Grand Junction, CO</u>	
DATE STARTED <u>10/11/23</u> COMPLETED <u>10/11/23</u>	GROUND ELEVATION _____ HOLE SIZE <u>4-Inch</u>	
DRILLING CONTRACTOR <u>S. McCracken</u>	GROUND WATER LEVELS:	
DRILLING METHOD <u>Simco 2000 Truck Rig</u>		AT TIME OF DRILLING <u>Dry</u>
LOGGED BY <u>TC</u> CHECKED BY <u>MAB</u>		AT END OF DRILLING <u>Dry</u>
NOTES _____	AFTER DRILLING <u>--</u>	

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	ASPHALT											
	Lean CLAY with Sand (cl), brown to gray and black, moist, soft to stiff		SS 1	72	1-2-3 (5)							
5												
			SS 2	44	2-1-3 (4)							
10												
		**Petroleum Odor	SS 3	100	4-4-5 (9)							
15												
		Silty SAND (sm), brown, moist, medium dense	SS 4	83	2-2-5 (7)							
20												
		Sandy GRAVELS and COBBLES (bldrccbbl), gray, moist, dense										
		Bottom of hole at 23.0 feet.										

GEOTECH BH COLUMNS 02742-0001 THE TERMINAL PROJECT.GPJ GINT US LAB.GDT 11/6/23



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

BORING NUMBER B-6

PAGE 1 OF 1

CLIENT <u>Grand Junction Downtown Development Authority</u>	PROJECT NAME <u>The Terminal</u>	
PROJECT NUMBER <u>02742-0001</u>	PROJECT LOCATION <u>Grand Junction, CO</u>	
DATE STARTED <u>10/11/23</u> COMPLETED <u>10/11/23</u>	GROUND ELEVATION _____ HOLE SIZE <u>4-Inch</u>	
DRILLING CONTRACTOR <u>S. McCracken</u>	GROUND WATER LEVELS:	
DRILLING METHOD <u>Simco 2000 Truck Rig</u>		AT TIME OF DRILLING <u>Dry</u>
LOGGED BY <u>TC</u> CHECKED BY <u>MAB</u>		AT END OF DRILLING <u>Dry</u>
NOTES _____	AFTER DRILLING <u>--</u>	

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	ASPHALT	ASPHALT										
0 - 5	Lean CLAY with Sand (cl), brown to black, moist, soft to medium stiff	Lean CLAY with Sand (cl), brown to black, moist, soft to medium stiff	SS 1	78	2-1-3 (4)							
5 - 10	Silty SAND (sm), gray, moist, medium dense **Petroleum Odor	Silty SAND (sm), gray, moist, medium dense **Petroleum Odor	SS 2	100	2-2-3 (5)							
10 - 15	Silty SAND (sm), gray, moist, medium dense **Petroleum Odor	Silty SAND (sm), gray, moist, medium dense **Petroleum Odor	SS 3	100	3-3-3 (6)							
15 - 20	Silty SAND (sm), gray, moist, medium dense **Petroleum Odor	Silty SAND (sm), gray, moist, medium dense **Petroleum Odor	SS 4	83	1-2-4 (6)							
20 - 23.0	Sandy GRAVELS and COBBLES (bldrcbbl), gray, moist, dense	Sandy GRAVELS and COBBLES (bldrcbbl), gray, moist, dense										
		Bottom of hole at 23.0 feet.										

GEOTECH BH COLUMNS 02742-0001 THE TERMINAL PROJECT.GPJ GINT US LAB.GDT 11/6/23

APPENDIX C
Laboratory Testing Results



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

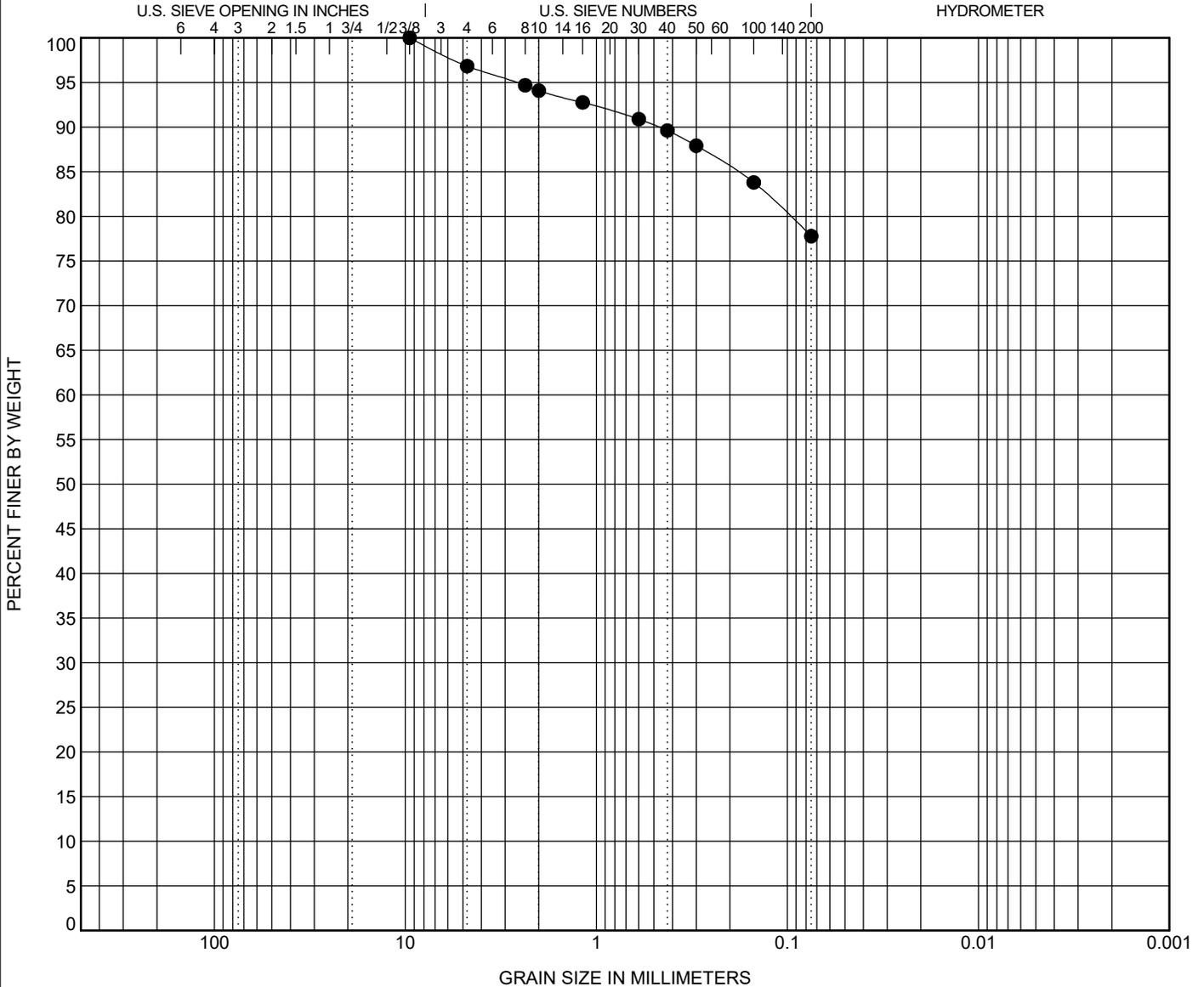
GRAIN SIZE DISTRIBUTION

CLIENT Grand Junction Downtown Development Authority

PROJECT NAME The Terminal

PROJECT NUMBER 02742-0001

PROJECT LOCATION Grand Junction, CO



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification					LL	PL	PI	Cc	Cu
● COMPOSITE 10/11	LEAN CLAY with SAND(CL)					28	16	12		
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay		
● COMPOSITE 10/11	9.5				3.2	19.1	77.8			

GRAIN SIZE 02742-0001 THE TERMINAL PROJECT.GPJ GINT US LAB.GDT 11/2/23



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

MOISTURE-DENSITY RELATIONSHIP

CLIENT Grand Junction Downtown Development Authority

PROJECT NAME The Terminal

PROJECT NUMBER 02742-0001

PROJECT LOCATION Grand Junction, CO

Sample Date: 10/11/2023
 Sample No.: 23-0665
 Source of Material: COMPOSITE
 Description of Material: LEAN CLAY with SAND(CL)
 Test Method (manual): ASTM D698A

TEST RESULTS

Maximum Dry Density 112.0 PCF
 Optimum Water Content 14.5 %

GRADATION RESULTS (% PASSING)

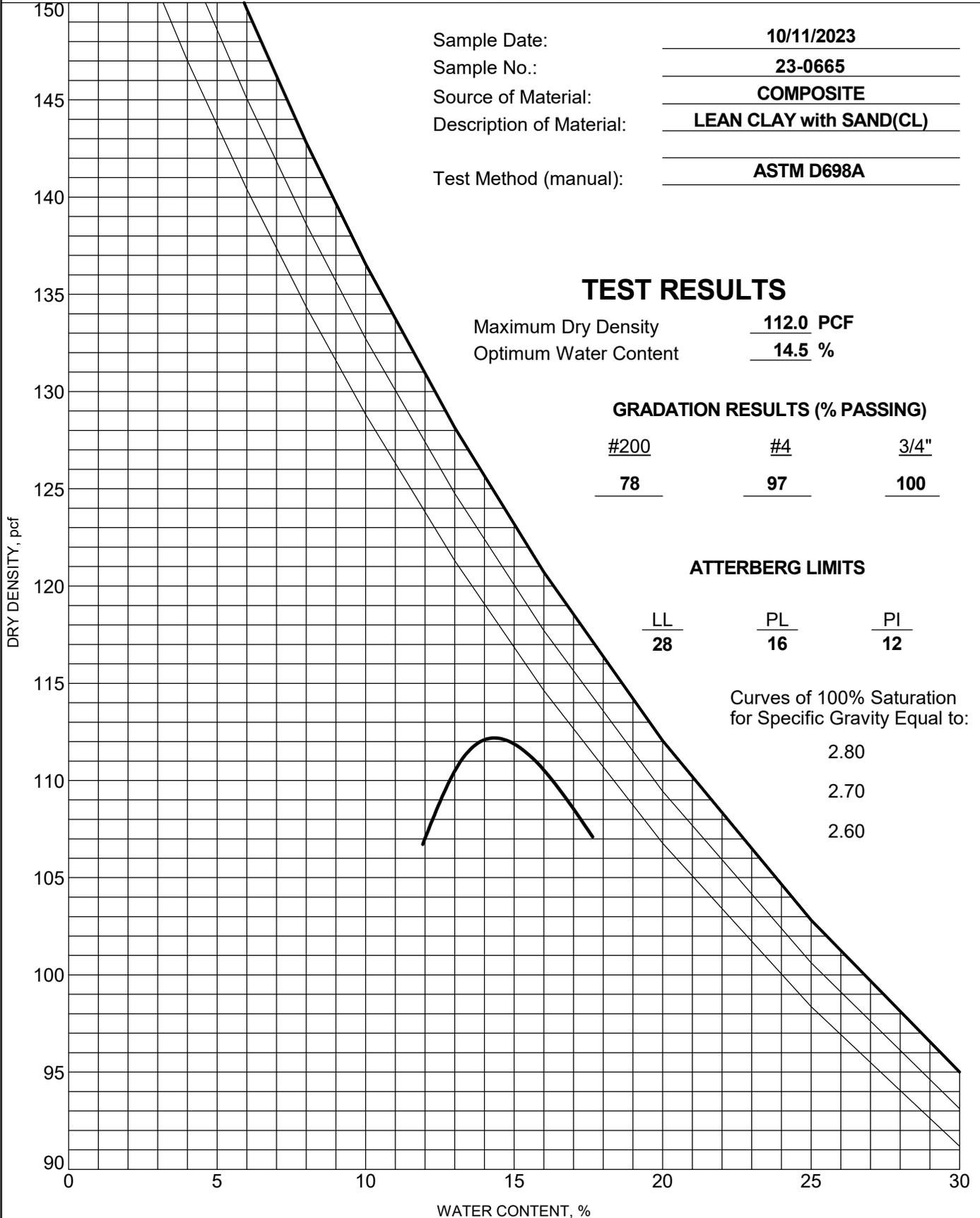
#200	#4	3/4"
<u>78</u>	<u>97</u>	<u>100</u>

ATTERBERG LIMITS

LL	PL	PI
<u>28</u>	<u>16</u>	<u>12</u>

Curves of 100% Saturation
 for Specific Gravity Equal to:

2.80
 2.70
 2.60



COMPACTION 02742-0001 THE TERMINAL PROJECT.GPJ GINT US LAB.GDT 11/2/23