ENTECH
ENGINEERING, INC.

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March 19, 2021
Revised April 27, 2021

William Guman & Associates, Ltd
731 North Weber Street
Colorado Springs, CO 80903

Attn: Bill Guman

Re: Soil, Geology and Geologic Hazard Evaluation
Mountain's Edge Subdivision
McClelland Road & Farmhouse Court
Parcel No. 32000-00-740
El Paso County, Colorado

Dear Mr. Guman:

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION:

The site is located in a portion N½ of the N½ of the SW¼ of Section 13, Township 12 South, Range 63 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 4¼ miles southeast of Peyton, Colorado, northwest of McClelland Road and Scott Road in El Paso County, Colorado. The location of the site is as shown on the Vicinity Map, Figure 1.

The topography of the site is gradually sloping generally to the southeast with gradual to moderate slopes along the small ridge that bisects the site in the eastern portion of the site. A drainage is located east of the proposed subdivision and flows in a southwesterly direction. A minor drainage area is located in the central portion of the site located in portions of Lots 2 and 3. Water was not observed in the drainages at the time of this investigation. The site boundaries are indicated on the USGS Map, Figure 2. Previous land uses have included agricultural grazing and undeveloped land. The site contains primarily field grasses, weeds, cacti and yuccas. Site photographs, taken May 19, 2020, are included in Appendix A.

Total acreage involved in the proposed subdivision is 30.6-acres. Five rural residential lots are proposed as part of the replat. The proposed lot sizes range from approximately 5-acres to 6-acres. The lots will be serviced by individual water wells and on-site wastewater treatment systems. The Site Plan with the proposed replat is presented in Figure 3

LAND USE AND ENGINEERING GEOLOGY:

This site was found to be suitable for the proposed development, which will consist of rural residential lots and associated site improvements. Areas were encountered where the geologic conditions will impose some constraints on development and land use. These include areas of artificial fill, hydrocompaction, floodplain, shallow bedrock, and seasonally shallow groundwater areas. Based on the proposed development plan, it appears that these areas will have some impacts on the development. These conditions will be discussed in greater detail in the report.

In general, it is our opinion that the development can be achieved if the observed geologic conditions on site are either avoided or properly mitigated. All recommendations are subject to the limitations discussed in the report.

SCOPE OF THE REPORT:

The scope of the report will include the following:

- A general geologic analysis utilizing published geologic data. Detailed site-specific mapping will be conducted to obtain general information in respect to major geographic and geologic features, geologic descriptions and their effects on the development of the property.

FIELD INVESTIGATION:

Our field investigation consisted of the preparation of a geologic map of any bedrock features and significant surficial deposits. The Natural Resource Conservation Service (NRCS), previously the Soil Conservation Service (SCS) survey was also reviewed to evaluate the site. The position of mappable units within the subject property are shown on the Geologic Map. Our mapping procedures involved both field reconnaissance and measurements, and aerial photo reconnaissance and interpretation. The same mapping procedures have also been utilized to produce the Geology Map which identified pertinent geologic conditions affecting development. The field mapping was performed by personnel of Entech Engineering, Inc. on May 19, 2020.

Three test pits were excavated across the site on Lot Nos. 1, 2 and 4 to determine general suitability for the use of on-site wastewater treatment systems and general soil characteristics. The locations of the test pits are indicated on the Site Plan/Test Pit Location Map, Figure 3. The Test Pit Logs are presented in Appendix B. Results of this testing will be discussed later in this report.

Laboratory testing was also performed on the soils to classify and determine the soils engineering characteristics. Laboratory tests included grain-size analysis, ASTM D-422. Results of the laboratory testing are included in Appendix C.

PREVIOUS INVESTIGATIONS:

A Geology and Soils Study was previously prepared for this site by Kumar and Associates, Inc., November 14, 2008 (Reference 1). Information from this report was used in our investigation of the site. Test Boring locations and logs are included in Appendix D. The soils in the test borings consist of clayey to silty sand, sandy clay, and clayey sandstone. Bedrock was encountered in two of the test borings at depths of 2 feet and 18 feet.

SOIL AND GEOLOGIC CONDITIONS:

Soil Survey

The Natural Resource Conservation Service (NRCS) (Reference 2, Figure 4), previously the Soil Conservation Service (Reference 2) has mapped four soil types on the site. Complete descriptions of the soil types are presented in Appendix E. In general, the soils consist of sandy loam to gravelly loamy sand. The soils are described as follows:

Type	Description
8	Blakeland Loamy Sand, 1 – 9% Slopes
10	Blendon Sandy Loam, 0 – 3% Slopes
96	Truckton Sandy Loam, 0 – 3% Slopes
97	Truckton Sandy Loam, 3 – 9% Slopes

The soils have been described to have moderate to rapid permeabilities. The soils are described as well suited for use as homesites. Possible hazards with soils erosion are present on the site. The erosion potential can be controlled with vegetation. The soils have been described to have moderate erosion hazards (Reference 2).

Soils

The soils encountered in the test pits consisted of silty to clayey sand overlying weathered silty to clayey sandstone. Bedrock was not encountered in Test Pit Nos 1 and 2. Weathered bedrock was encountered In Test Pit No. 3 at of depth 3.5 feet. The upper sands were encountered at loose to medium dense states and moderate moisture conditions, and the sandstone was encountered at dense states and moderate moisture conditions.

Groundwater

Groundwater was not encountered in the test pits, which were excavated to 7 to 8 feet. Signs of seasonally occurring groundwater were observed in Test Pit No. 2 (Lot 3) at 7.5 feet. Groundwater was not encountered in the Kumar Test Borings in 2008, which were to depths of 20 feet. Areas of potentially seasonal shallow and seasonal shallow groundwater have been mapped in drainages on the site that are discussed in the following sections. Fluctuations in groundwater conditions may occur due to variations in rainfall or other factors not readily apparent at this time. Isolated sand layers within the soil profile can carry water in the subsurface. Contractors should be cognizant of the potential for the occurrence of subsurface water features during construction.

Geology

Approximately 27 miles west of the site is a major structural feature known as the Rampart Range Fault. This fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within a large structural feature

known as the Denver Basin. Bedrock in the area is typically gently dipping in a northerly direction (Reference 4). The bedrock underlying the site consists of the Dawson Formation of Cretaceous Age. The Dawson Formation typically consists of coarse-grained arkosic sandstone with interbedded layers claystone or siltstone.

The geology of the site was evaluated using the *Bedrock Geologic Map of the Denver Basin, by* Dechesne *et al,* in 2011, (Reference 4, Figure 5), the *Surficial Geologic Map of the Denver 1°x2° Quadrangle by* Moore *et al,* in 2001, (Reference 5), and the *Geologic Map of the Denver 1°x2° Quadrangle North-Central Colorado,* by Bryant *et al* in 1981 (Reference 6). The Geology Map for the site is presented in Figure 6. Four mappable units were identified on this site which is described as follows:

Qaf **Artificial Fill of Holocene Age:** These consist of man-made fill deposits associated with erosion berm on Lot 2.

Qal **Alluvium of Quaternary Age:** These are recent deposits that have been deposited along the drainages and low-lying areas that exist on-site. These materials consist of silty to clayey sands. Some of these alluviums can contain highly organic soils.

Qes **Eolian Sands of Quaternary Age:** These are wind-blown sands deposited by the action of prevailing winds. The materials typically consist of silty sands and may contain sandy silt layers.

Qc/Tkd **Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:** The materials consist of colluvial or residual soils overlying the bedrock materials on-site. The colluvial soils were deposited by the action of sheetwash and gravity. The residual soils were derived from the in-situ weathering of the bedrock on site. These materials typically consist of silty to clayey sand with potential areas of sandy clays. The bedrock consists of the Dawson Formation. The Dawson Formation typically consists of coarse-grained, arkosic sandstone with interbedded lenses of fine-grained sandstone, siltstone and claystone.

The soils listed above were mapped from site-specific mapping, the *Bedrock Geologic Map of the Denver Basin* distributed by the Colorado Geologic Survey in 2011 (Reference 4, Figure 5), the *Surficial Geologic Map of the Denver 1° x 2° Quadrangle,* distributed by the US Geological Survey in 2001 (Reference 5), and the *Geologic Map of the of the Denver 1°x2° Quadrangle North-Central Colorado,* distributed by the US Geological Survey in 1981 (Reference 6). The test pits were used in evaluating the site and are included in Appendix B. The Geology Map prepared for the site is presented in Figure 6.

ENGINEERING GEOLOGIC HAZARDS

Mapping has been performed on this site to identify areas where various geologic conditions exist of which developers should be cognizant during the planning, design and construction stages should new construction be proposed. The engineering geologic hazards identified on this site include artificial fill, potentially expansive soils, hydrocompaction, floodplain, and seasonally shallow groundwater areas. Additionally, shallow groundwater may be encountered at variable depths across the site. These hazards and recommended mitigation techniques are discussed as follows:

Artificial Fill
Fill associated with existing erosion berms were observed in the northern portion of Lot 2 the site (Figure 5). Based on the size of the lot this area can be avoided or properly mitigated.

Mitigation
Any uncontrolled fill encountered beneath foundations should be removed and recompacted at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557.

Expansive Soils
Potentially expansive clay soils were encountered in one of test pits excavated on–site. Clay soils were also encountered in Test Boring No. 2 (Kumar). Expansive claystone and siltstone are also commonly encountered within the Dawson Formation. Shallow bedrock was encountered in Test Pit No. 3 excavated on Lot 1 and in Test Boring No. 1 (Kumar) on Lot 1. These occurrences are typically sporadic; therefore, none have been indicated on the maps. These expansive soils, if encountered beneath foundations, can cause differential movement in the structure foundation. These occurrences should be identified and mitigated on an individual basis.

Mitigation: Should expansive soils be encountered beneath the foundation; mitigation will be necessary. Mitigation of expansive soils will require special foundation design. Overexcavation and replacement with non-expansive soils at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 is a suitable mitigation, which is common in the area. Overexcavation depths of 3 to 5 feet should be anticipated where expansive soils are encountered. Another alternative in areas of highly expansive soils is the use of drilled pier foundation systems. Typical minimum pier depths are on the order of 25 feet or more and require penetration into the bedrock material a minimum of 4 to 6 feet, depending upon building loads. Floor slabs on expansive soils should be expected to experience movement. Overexcavation and replacement has been successful in minimizing slab movements. The use of structural floors should be considered for basement construction on highly expansive clays. Final recommendations should be determined after additional investigation of each building site.

Floodplain and Drainage Areas

Minor drainages exist on-site that flow in southeasterly directions. No water was observed flowing in these drainages at the time of the investigation. Areas of seasonal shallow groundwater have been mapped along the drainages on the site (Figure 6) located on Lots 2 and 3. In this area the potential for flooding, bank erosion and sedimentation exist. These areas are designated as no-build areas on Figure 3, and will be avoided by any future construction.

In these areas, we would anticipate the potential for periodically high subsurface moisture conditions, frost heave potential and highly organic soils. These areas lie within minor drainage areas which can be avoided by the proposed development. Due to the potential for seasonal high groundwater conditions, on-site wastewater treatment systems are not recommended in these areas. The eastern side of the site lies within any floodplain zones according to the FEMA Map No. 08041CO375G dated December 7, 2018 (Figure 7, Reference 7). Exact locations of floodplain and specific drainage studies are beyond the scope of this report. Individual wastewater treatment systems must be located a minimum of 25 feet from dry gulches and 50 feet from water courses or floodplains.

sw –Seasonal shallow groundwater areas: In these areas, we would anticipate the potential for periodically high subsurface moisture conditions, frost heave potential, and highly organic soils. The seasonal shallow groundwater areas are located on Lot Nos. 2 and 3. In these areas the potential for flooding, bank erosion and sedimentation exist. Additionally, the potential for accelerated erosion exist on portions Lot 3. These areas are designated as no-build areas on Figure 3, and will be avoided by any future construction. Areas where perched water conditions are encountered should also follow these recommendations. Construction proposed in or adjacent to these areas, should follow these precautions:

Mitigation: In these locations, foundations are subject to severe frost heave and should penetrate to a sufficient depth so as to prevent the formation of ice lenses beneath foundations. At this location and elevation, a foundation depth for frost protection of 30-inches is recommended. In areas where high subsurface moisture conditions are anticipated periodically, a subsurface perimeter drain will be necessary to help prevent the seepage of water into areas below grade. A typical perimeter drain detail is presented in Figure 8. Any grading in these areas should be done in a manner that directs surface flow around construction to avoid areas of ponded water. Areas of organic material will require removal prior to any fill placement. Unstable soil conditions should be expected in areas of shallow groundwater. Where foundations approach the groundwater level, stabilization of the excavations utilizing shot rock may be necessary. Underslab drains or capillary breaks, and interceptor drains may be necessary to prevent intrusion of water into areas below grade. Typical drain details are presented in Figures 9 and 10.

fp – Floodplain: Areas of the site have been mapped as floodplains according to the FEMA Map No. 08041CO375G (Figure 7, Reference 7). The physiographic floodplains on site have been mapped on the Engineering Geology Map (Figure 6). The floodplain area has been designated as a no-build area and will be avoided by development. Finished floor levels must be a minimum

of one foot above the floodplain level. Structures should not block drainages. Specific floodplain locations and drainage studies are beyond the scope of this report.

Hydrocompaction
Areas in which hydrocompaction have been identified are acceptable as building sites. In areas identified for this hazard classification, however, we anticipate a potential for settlement upon saturation of these surficial soils. The low density, uniform grain sized, windblown sand deposits are particularly susceptible to this type of phenomenon. Lots 4 and 5 are located in the area mapped as eolian sands (Qes) which have the potential for hydrocompaction.

Mitigation: The potential for settlement is directly related to saturation of the soils below the foundation areas. Therefore, good surface and subsurface drainage is extremely critical in these areas in order to minimize the potential for saturation of these soils. The ground surface around all permanent structures should be positively sloped away from the structure to all points, and water must not be allowed to stand or pond anywhere on the site. We recommend that the ground surface within 10 feet of the structures be sloped away with a minimum gradient of five percent. If this is not possible on the upslope side of the structures, then a well-defined swale should be created to intercept the surface water and carry it quickly and safely around and away from the structures. Roof drains should be made to discharge well away from the structures and into areas of positive drainage. Where several structures are involved, the overall drainage design should be such that water directed away from one structure is not directed against an adjacent building. Planting and watering in the immediate vicinity of the structures, as well as general lawn irrigation, should be minimized.

RELEVANCE OF GEOLOGIC CONDITIONS TO LAND USE PLANNING:

The proposed development will consist of subdividing the parcel into five rural residential lots, and associated site improvements. The existing geologic and engineering geologic conditions will impose constraints on development and construction. The geologic conditions on the site include artificial fill, hydrocompaction, floodplains, and seasonally shallow groundwater areas, which can be satisfactorily mitigated through proper engineering design and construction practices.

The upper materials are typically at medium dense to dense states. Areas of loose soils where encountered may require recompaction. The medium dense to dense granular soils encountered in the upper soil profiles of the test pits should provide good support for foundations. Loose soils, if encountered beneath foundations or slabs, will require removal and recompaction. Expansive soils, although sporadic, were encountered. Expansive clayey sandstone and claystone are common in the Dawson Formation, and may require mitigation. Foundations anticipated for the site are standard spread footings possibly in conjunction with overexcavation in areas of expansive soils or loose soils. Areas of artificial fill, if encountered beneath foundations will require penetration or recompaction. Areas containing arkosic sandstone will have high allowable bearing conditions. Shallow sandstone bedrock was encountered on Lot 1, and the western portion of Lot 2 (Reference 1). Expansive layers may

also be encountered in the soil and bedrock on this site. Expansive soils, if encountered, will require special foundation design and/or overexcavation. These soils will not prohibit development.

Areas of seasonal shallow groundwater, and floodplains exist on this site on Lot Nos. 2 and 3. The floodplain and seasonal shallow groundwater areas are to be avoided by development and preserved as open space in drainage easements. Structures adjacent to these areas may require drains to help prevent the intrusion into areas below grade. Typical drain details are included in Figures 8 through 10. Finished floor levels must be a minimum of one foot above the floodplain level. Exact floodplain locations are beyond the scope of this report. According to the site plan (Figure 6), some of the minor drainage areas can be avoided or filled which will mitigate the hazard.

Areas of hydrocompation have been identified on this site where there is the potential for settlement movements upon saturation of the surficial soils. Good surface and subsurface drainage are critical in these areas and the ground surface should be positively sloped away from structures at all points. Roof drains should be made to discharge well away from structures and planting and watering in the immediate vicinity of structures should be minimized.

Fill exists on this site on Lot 2 that is associated with erosion berms. Areas of fill, other than those mapped, may be encountered. If encountered all fill and debris within building areas should be completely removed prior to construction. Any uncontrolled fill encountered beneath new foundations and floor slabs will require removal and recompaction at a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557.

In summary, development of the site can be achieved if the items discussed above are mitigated. These items can be mitigated through proper design and construction or by avoidance. **Lot specific Subsurface Soil Investigations are needed prior to construction to provide proper construction and foundation recommendations.**

ECONOMIC MINERAL RESOURCES

Some of the sandy materials on-site could be considered a low-grade sand resource. According to the *El Paso County Aggregate Resource Evaluation Map* (Reference 8), of the area of the site is mapped as upland deposits. According to the *Atlas of Sand, Gravel and Quarry Aggregate Resources, Colorado Front Range Counties* distributed by the Colorado Geological Survey (Reference 9), areas of the site are mapped as U3: upland deposits: sand. According to the *Evaluation of Mineral and Mineral Fuel Potential* (Reference 10), the area of the site has been mapped as "Fair" for industrial minerals. However, considering the silty to clayey nature of much of these materials and abundance of similar materials through the region and the close proximity to developed land, they would be considered to have little significance as an economic resource.

According to *the Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands* (Reference 10), the site is mapped within the Denver Basin Coal Region. However, the area of the site has been mapped as "Poor" for coal resources. No active or inactive mines have been mapped in the area of the site. No metallic mineral resources have been mapped on the site (Reference 10).

The site has been mapped as "Fair" for oil and gas resources (Reference 10). No oil or gas fields have been discovered in the area of the site. The sedimentary rocks in the area may lack the geologic structure for trapping oil or gas; therefore, it may not be considered a significant resource. Hydraulic fracturing is a new method that is being used to extract oil and gas from rocks. It utilizes pressurized fluid to extract oil and gas from rocks that would not normally be productive. The area of the site has not been explored to determine if the rocks underlying the site would be commercially viable utilizing hydraulic fracturing. The practice of hydraulic fracturing has come under review due to concerns about environmental impacts, health and safety.

EROSION CONTROL

The soil types observed on the site are mildly to highly susceptible to wind erosion, and moderately to highly susceptible to water erosion. A minor wind erosion and dust problem may be created for a short time during and immediately after construction. Should the problem be considered severe enough during this time, watering of the cut areas or the use of chemical palliative may be required to control dust. However, once construction has been completed and vegetation re-established, the potential for wind erosion should be considerably reduced.

With regard to water erosion, loosely compacted soils will be the most susceptible to water erosion, residually weathered soils and weathered bedrock materials become increasingly less susceptible to water erosion. For the typical soils observed on site, allowable velocities or unvegetated and unlined earth channels would be on the order of 3 to 4 feet/second, depending upon the sediment load carried by the water. Permissible velocities may be increased through the use of vegetation to something on the order of 4 to 7 feet/second, depending upon the type of vegetation established. Should the anticipated velocities exceed these values, some form of channel lining material may be required to reduce erosion potential. These might consist of some of the synthetic channel lining materials on the market or conventional riprap. In cases where ditch-lining materials are still insufficient to control erosion, small check dams or sediment traps may be required. The check dams will serve to reduce flow velocities, as well as provide small traps for containing sediment. The determination of the amount, location and placement of ditch linings, check dams and of the special erosion control features should be performed by or in conjunction with the drainage engineer who is more familiar with the flow quantities and velocities.
Cut and fill slope areas will be subjected primarily to sheetwash and rill erosion. Unchecked rill erosion can eventually lead to concentrated flows of water and gully erosion. The best means to combat this type of erosion is, where possible, the adequate re-vegetation of cut and fill slopes. Cut and fill slopes having gradients more than three (3) horizontal to one (1) vertical

become increasingly more difficult to revegetate successfully. Therefore, recommendations pertaining to the vegetation of the cut and fill slopes may require input from a qualified landscape architect and/or the Soil Conservation Service.

CLOSURE:

It should be pointed out that because of the nature of data obtained by random sampling of such variable nonhomogeneous materials as soil and rock, it is important that we be informed of any differences observed between surface and subsurface conditions encountered in construction and those assumed in the body of this report. Any new construction considered on this site will require additional investigation. Construction and design personnel should be made familiar with the contents of this report. **Specific construction and foundation recommendations should be provided when investigations are completed at each building site prior to new construction.**

This report has been prepared for William Guman and Associates, LTD for application to the proposed development in accordance with generally accepted geologic, soil and engineering practices. No other warranty expresses or implied is made.

We trust that this report has provided you with all the information that you required. Should you have any questions or require additional information, please do not hesitate to contact us.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Logan L. Langford, P.G.
Geologist

Kristen A. Andrew-Hoeser, P.G.
Senior Geologist

Reviewed by:

Joseph C. Goode, Jr., P.E.
President

LLL

Encl.

Entech Job No. 200989
AAprojects/2020/200989 sg&ghs

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TABLE

Table 1: Summary Tactile Test Pit Results

Test Pit No.	USDA Soil Type	LTAR Value	Depth to Bedrock (ft.)	Depth to Seasonally Occurring Groundwater (ft.)
1	2A	0.50	N/A	N/A
2	3	0.35	N/A	7.5
3	3A*	0.30	3.5*	N/A

*- Conditions that will require an engineered OWTS

FIGURES

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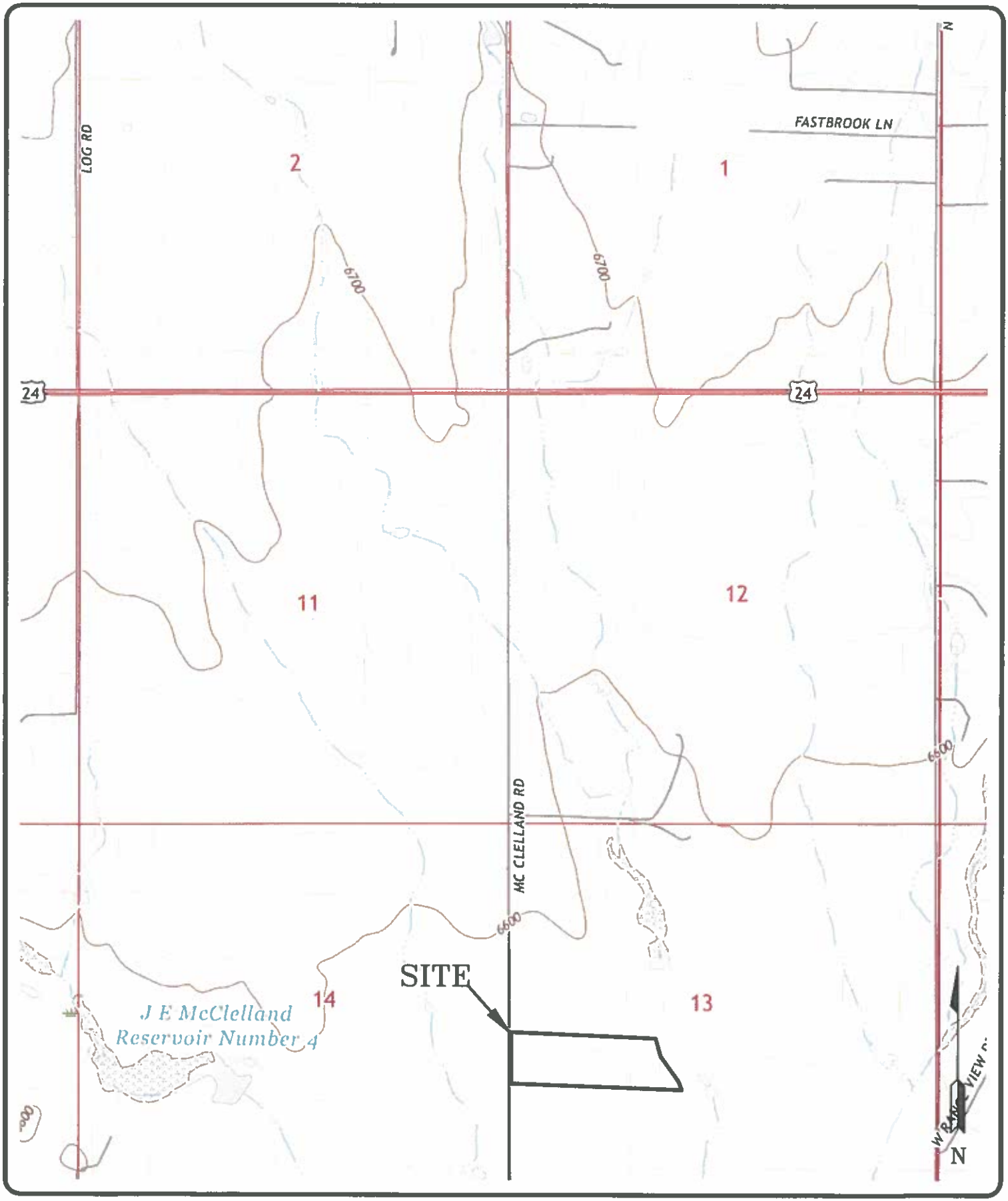
VICINITY MAP
MOUNTAIN'S EDGE SUBDIVISION
McCLELLAND ROAD & FARMHOUSE COURT
EL PASO COUNTY, CO.
FOR: WILLIAM GUMAN & ASSC. LTD

DRAWN:	DATE:	CHECKED:	DATE:
LLL	6/1/20		

JOB NO.: 200989

FIG NO.: 1



ENTECH ENGINEERING, INC.
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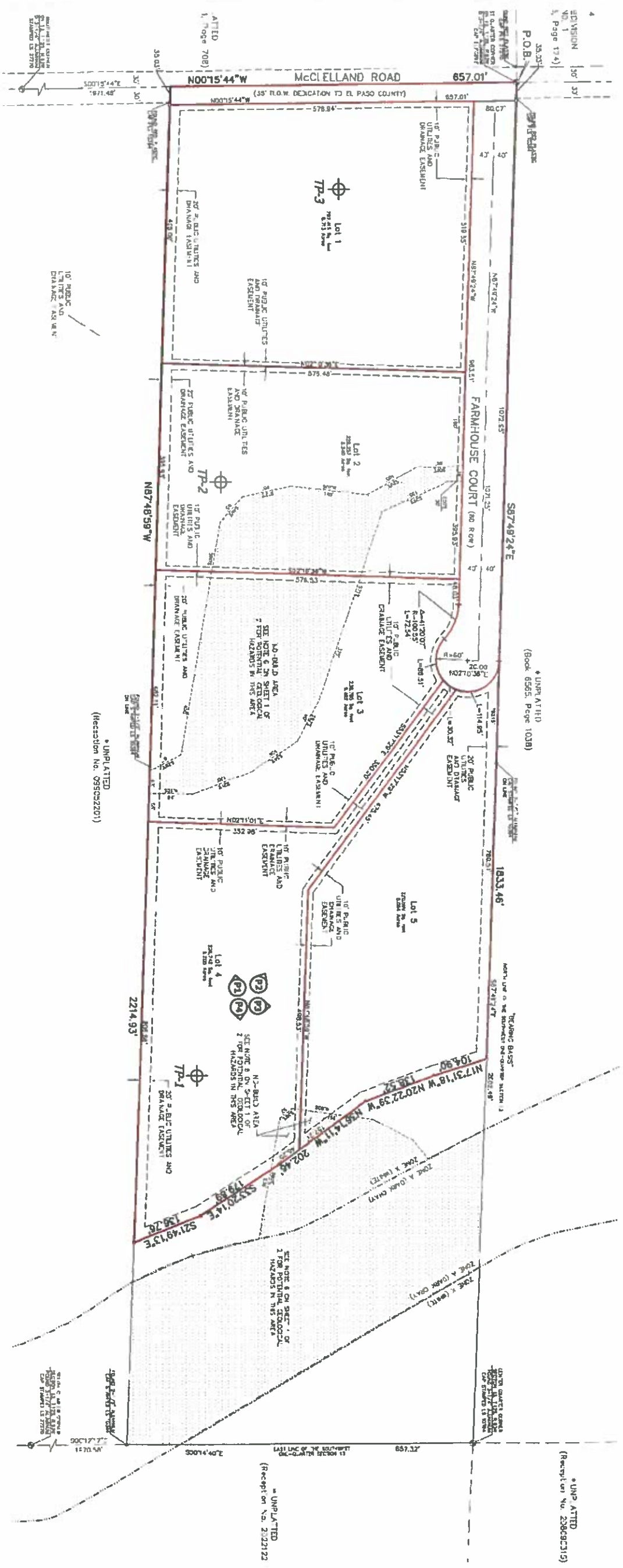
USGS MAP
MOUNTAIN'S EDGE SUBDIVISION
McCLELLAND ROAD & FARMHOUSE COURT
EL PASO COUNTY, CO.
FOR: WILLIAM GUMAN & ASSC. LTD

DRAWN:	DATE:	CHECKED:	DATE:
LLL	6/1/20		

JOB NO.: 200989

FIG NO.: 2



LEGEND:

- ⊕ – indicates survey monument set with a #4 rebar with Surveyor's Cap, PLS #20681.
- ● – indicates recovered survey monument as noted.
- * – indicates not a part of this subdivision.
- ——— – indicates FEMA local hazard delineation line
- [ ] – indicates NO-BUILD area

⊕ - approximate test pit location and number

(P1) - approximate photograph location and number

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DATE	6/1/20
SCALE	AS SHOWN
JOB NO.	200069
FIGURE NO.	3

SITE PLAN/TESTING LOCATION MAP
MOUNTAIN'S EDGE SUBDIVISION
McCLELLAND ROAD & FARMHOUSE COURT
EL PASO COUNTY, CO.
FOR: WILLIAM GUMAN & ASSC. LTD

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REVISION	BY

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ENTECH ENGINEERING, INC.
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SOIL SURVEY MAP
MOUNTAIN'S EDGE SUBDIVISION
McCLELLAND ROAD & FARMHOUSE COURT
EL PASO COUNTY, CO.
WILLIAM GUMAN & ASSC. LTD

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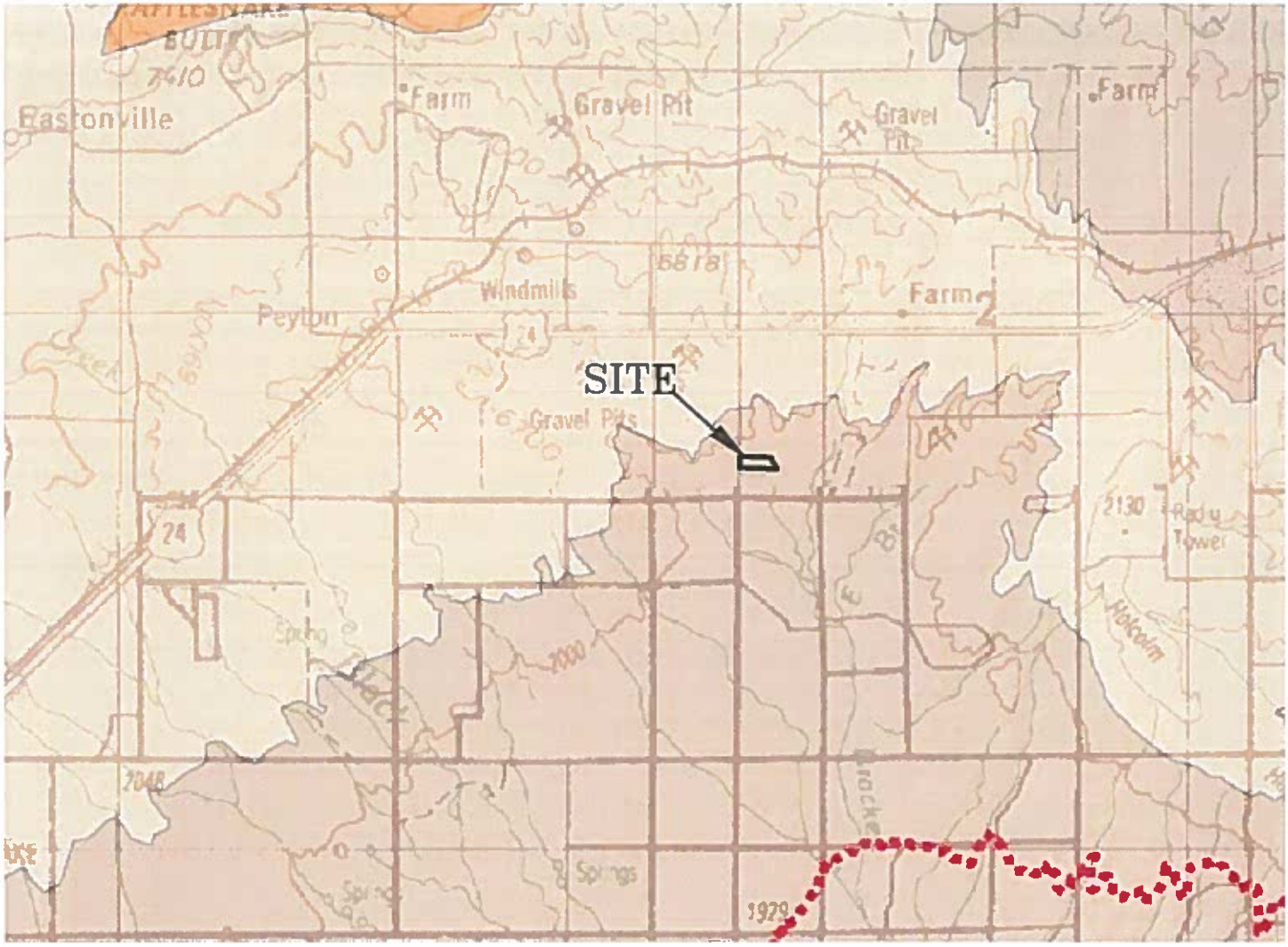
JOB NO.: 200989

FIG NO.: 4



Explanation of Symbols

Geology

- Core Hole
- K-T Boundary Site
- K-T Boundary

The K-T Boundary was modeled based on field sites and cores discovered and described by various colleques of the NSF funded-DMNS Denver Basin Project. It is not shown on the western margin where it has not been discovered and structure is more complex

Faults

Faults near or in the mountains were omitted from this map For the Boulder - Weld Fault Zone, Twito (1979) 1:500,000 faults were used

- Fault

Geologic Units

- Undifferentiated younger Tertiary rocks
- Denver Basin Group D2 Sequence (Eocene) *Also known as Dawson Arkose or Dawson Formation*
- Table Mountain Lava Flows (Paleocene)
- Denver Basin Group D1 Sequence (Cretaceous to Paleocene) *Also known as, or including, the Dawson Arkose, Dawson Fm., Denver fm. or Arapahoe Fm.*

Subdivisions mapped by J.P. Thorson (in press.)

Denver Formation (TKd), Pikeview Formation (Kpv), Jimmy Camp Formation (TKjc), Black Squirrel Formation (TKbs), Dawson Arkose (Tda)

- Laramie Formation (Cretaceous)
- Fox Hills Sandstone (Cretaceous) *Base is modeled at a depth of 200 ft below the top*
- Pierre Shale (Cretaceous)
- Undifferentiated Mesozoic and Paleozoic Rocks
- Undifferentiated Precambrian Crystalline Basement

N

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DENVER BASIN GEOLOGIC MAP
MOUNTAIN'S EDGE SUBDIVISION
McCLELLAND ROAD & FARMHOUSE COURT
EL PASO COUNTY, CO.
WILLIAM GUMAN & ASSC. LTD

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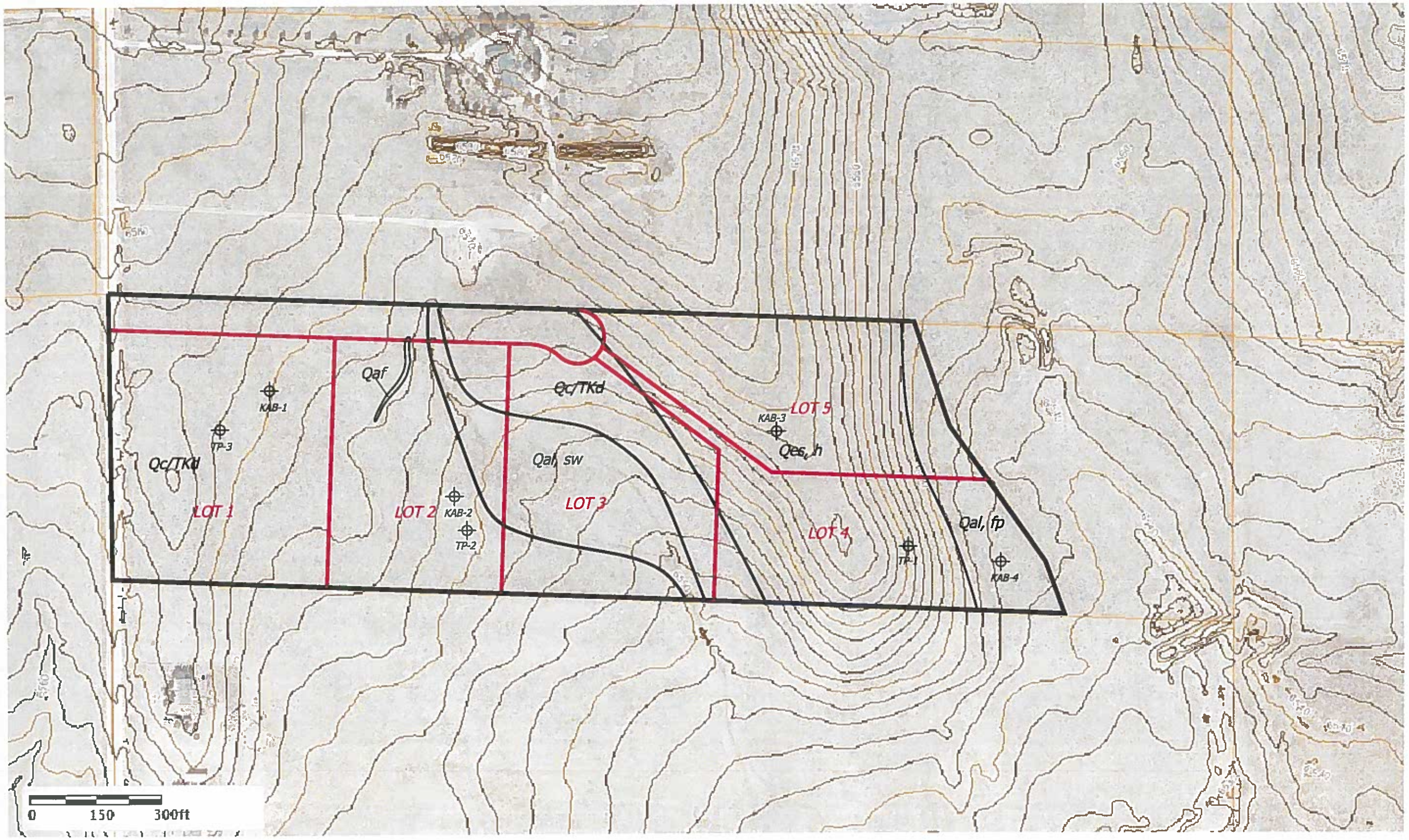
JOB NO.: 200989

FIG NO.: 5



Legend:

Qaf - Artificial Fill of Holocene Age:
man-made fill deposits

Qal - Alluvium of Quaternary Age:
water deposited materials

Qes - Eolian Sands of Quaternary Age:
wind blown sediments

QcTKd - Colluvium of Quaternary Age overlying Dawson Formation of Tertiary to Cretaceous Age:
colluvial and residual soils overlying arkosic sandstone with interbedded fine-grained sandstone, siltstone and claystone

fp - physiographic floodplain
h - hydrocompaction
sw - shallow groundwater area

REVISION	BY

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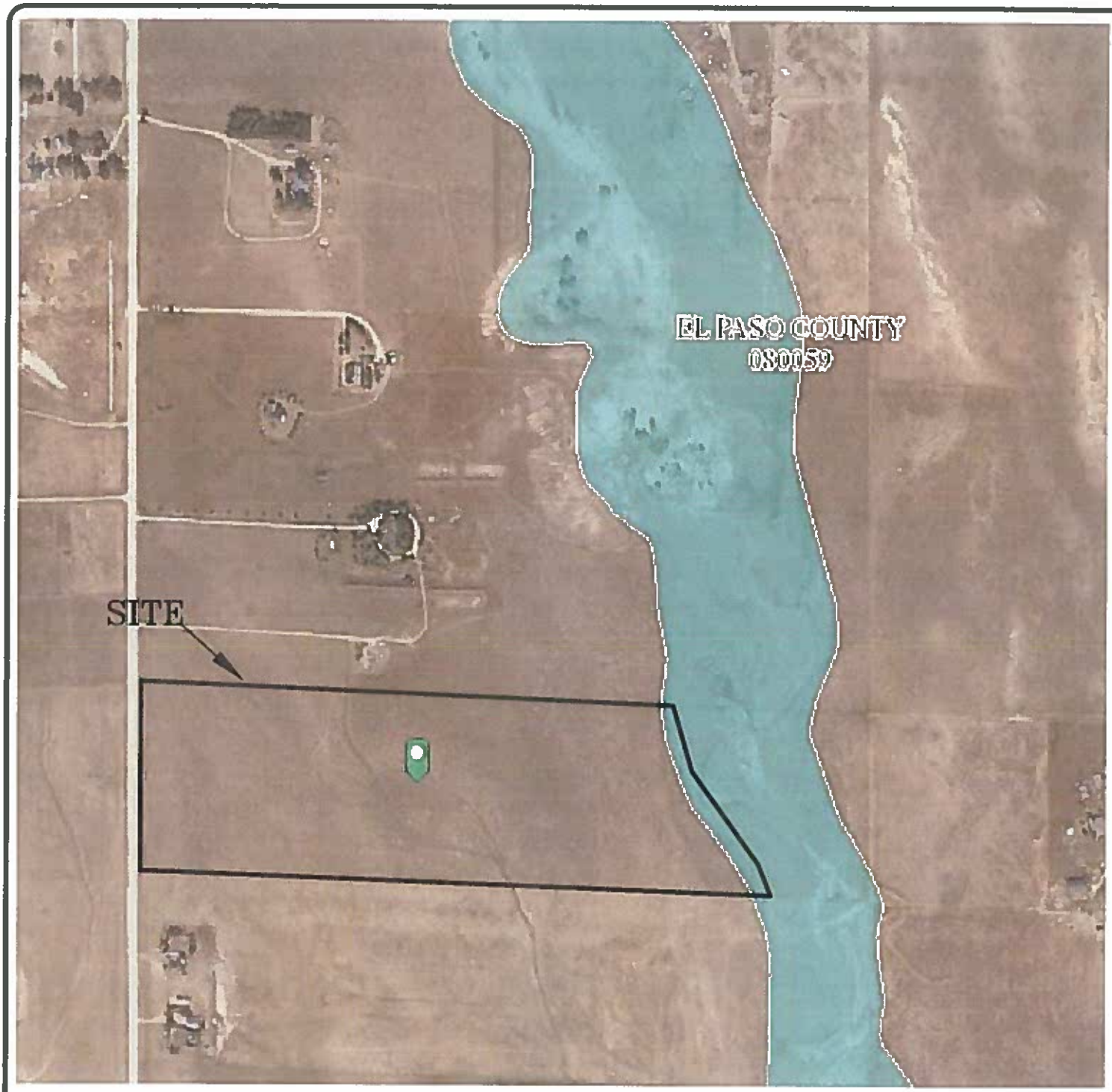
(719) 531-5599

GEOLOGY MAP
MOUNTAIN'S EDGE SUBDIVISION
McCLELLAND ROAD & FARMHOUSE COURT
EL PASO COUNTY, CO.
WILLIAM GUMAN & ASSC. LTD

DRAWN	LLL
CHECKED	
DATE	6/1/20
SCALE	AS SHOWN
JOB NO.	200989
FIGURE No.	6



N

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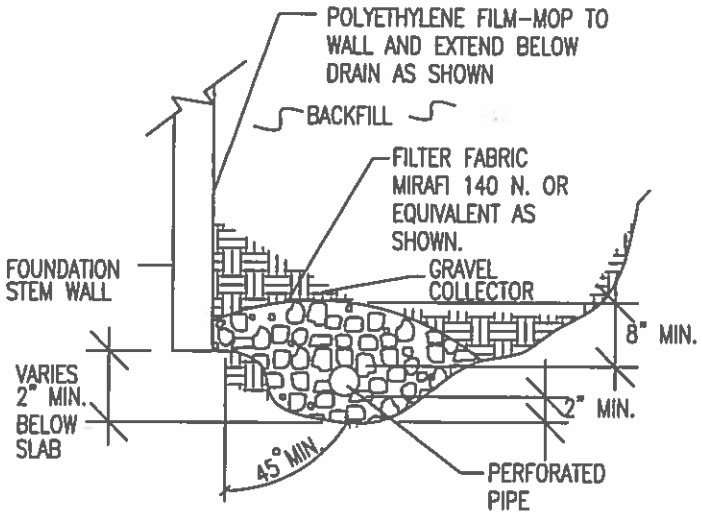
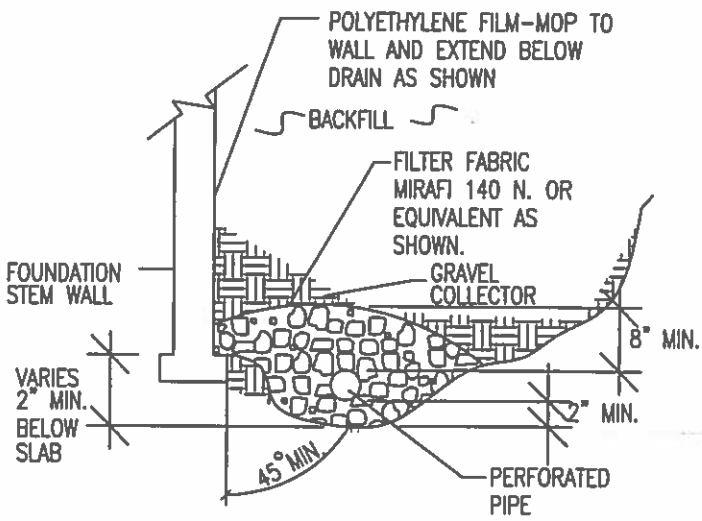
FEMA FLOODPLAIN MAP
MOUNTAIN'S EDGE SUBDIVISION
McCLELLAND ROAD & FARMHOUSE COURT
EL PASO COUNTY, CO.
FOR: WILLIAM GUMAN & ASSC. LTD

DRAWN:	DATE:	CHECKED:	DATE:
LLL	6/1/20		

JOB NO.: 200989

FIG NO.: 7





NOTES:

-GRAVEL SIZE IS RELATED TO DIAMETER OF PIPE PERFORATIONS-85% GRAVEL GREATER THAN 2x PERFORATION DIAMETER.

-PIPE DIAMETER DEPENDS UPON EXPECTED SEEPAGE. 4-INCH DIAMETER IS MOST OFTEN USED.

-ALL PIPE SHALL BE PERFORATED PLASTIC. THE DISCHARGE PORTION OF THE PIPE SHOULD BE NON-PERFORATED PIPE.

-FLEXIBLE PIPE MAY BE USED UP TO 8 FEET IN DEPTH, IF SUCH PIPE IS DESIGNED TO WITHSTAND THE PRESSURES. RIGID PLASTIC PIPE WOULD OTHERWISE BE REQUIRED.

-MINIMUM GRADE FOR DRAIN PIPE TO BE 1% OR 3 INCHES OF FALL IN 25 FEET.

-DRAIN TO BE PROVIDED WITH A FREE GRAVITY OUTFALL, IF POSSIBLE. A SUMP AND PUMP MAY BE USED IF GRAVITY OUT FALL IS NOT AVAILABLE.

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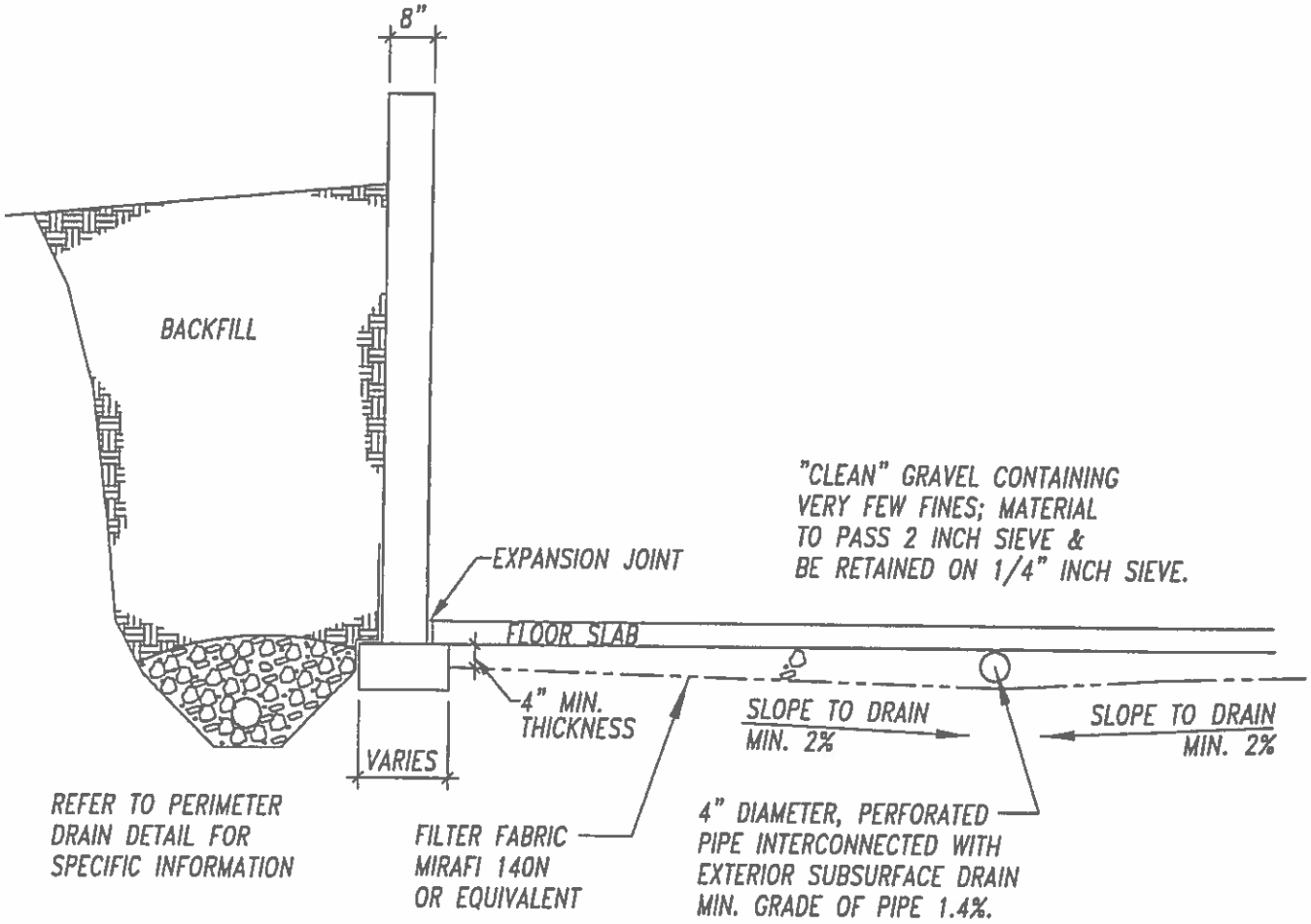
PERIMETER DRAIN DETAIL

DRAWN:	DATE:	DESIGNED:	CHECKED:
		DS	

JOB NO.: 200989

FIG NO.: 8



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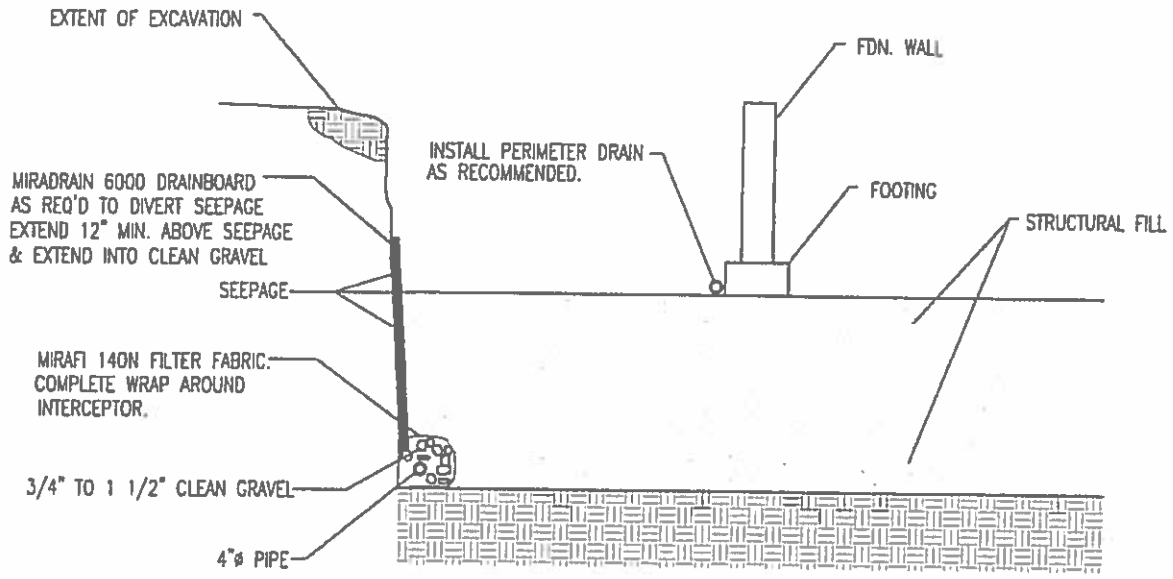
TYP. UNDERSLAB DRAINAGE
LAYER (CAPILLARY BREAK)

DRAWN:	DATE:	DESIGNED:	CHECKED:
		DS	CLL

JOB NO.: 200989

FIG NO.: 9



NOTE:
EXTEND INTERCEPTOR DRAIN TO DAYLIGHT

INTERCEPTOR DRAIN DETAIL

N.T.S.

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INTERCEPTOR DRAIN DETAIL			
DRAWN BY:	DATE DRAWN:		CHECKED: LLL

JOB NO.: 200989
FIG. NO.: 10

APPENDIX A: Photographs

1

Looking west from the central portion of Lot 4.

May 19, 2020

2

Looking northwest from the central portion of Lot 4.

May 19, 2020

Job No. 200989

3

Looking north from the central portion of Lot 4.

May 19, 2020

4

Looking east towards drainage from the eastern portion of the site.

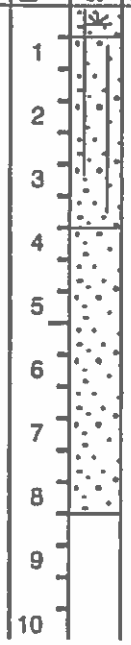
May 19, 2020

Job No. 200989

APPENDIX B: Test Pit Logs

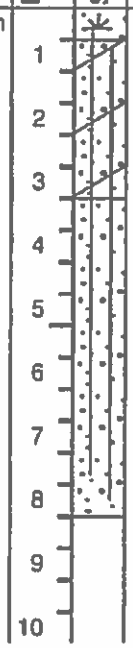
TEST PIT NO. 1
DATE EXCAVATED 5/19/2020
Job # 200989

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil, sandy loam, brown						
sandy loam, fine to coarse grained, tan				gr	l	2A
sand, fine to coarse grained, tan				sg		1



TEST PIT NO. 2
DATE EXCAVATED 5/19/2020
CLIENT WILLIAM GUMAN & ASSC. LTD
LOCATION McCLELLAND ROAD

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil, sandy clay loam, brown						
gravelly, sandy clay loam, fine to coarse grained, light brown				gr	m	3
gravelly sandy loam, fine to coarse grained, tan				gr	w	2A
*-signs of seasonally occuring groundwater at 7.5'						



Soil Structure Shape
granular - gr
platy - pl
blocky - bl
prismatic - pr
single grain - sg
massive - ma

Soil Structure Grade
weak - w
moderate - m
strong - s
loose - l

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TEST PIT LOG

DRAWN:	DATE	CHECKED: LLL	DATE 6/1/20

JOB NO. 200989
FIG NO. B-1

TEST PIT NO. 3
DATE EXCAVATED 5/19/2020
Job # 200989

CLIENT WILLIAM GUMAN & ASSC. LTD
LOCATION McCLELLAND ROAD

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil, sandy clay loam, brown	1					
gravelly, sandy loam, fine to coarse grained, light brown	2			gr	w	2A
	3					
weathered to formational silty sandstone, fine to coarse grained, light brown	4			ma		3A
	5					
	6					
	7					
	8					
	9					
	10					

REMARKS

Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					

Soil Structure Shape
granular - gr
platy - pl
blocky - bl
prismatic - pr
single grain - sg
massive - ma

Soil Structure Grade
weak - w
moderate - m
strong - s
loose - l

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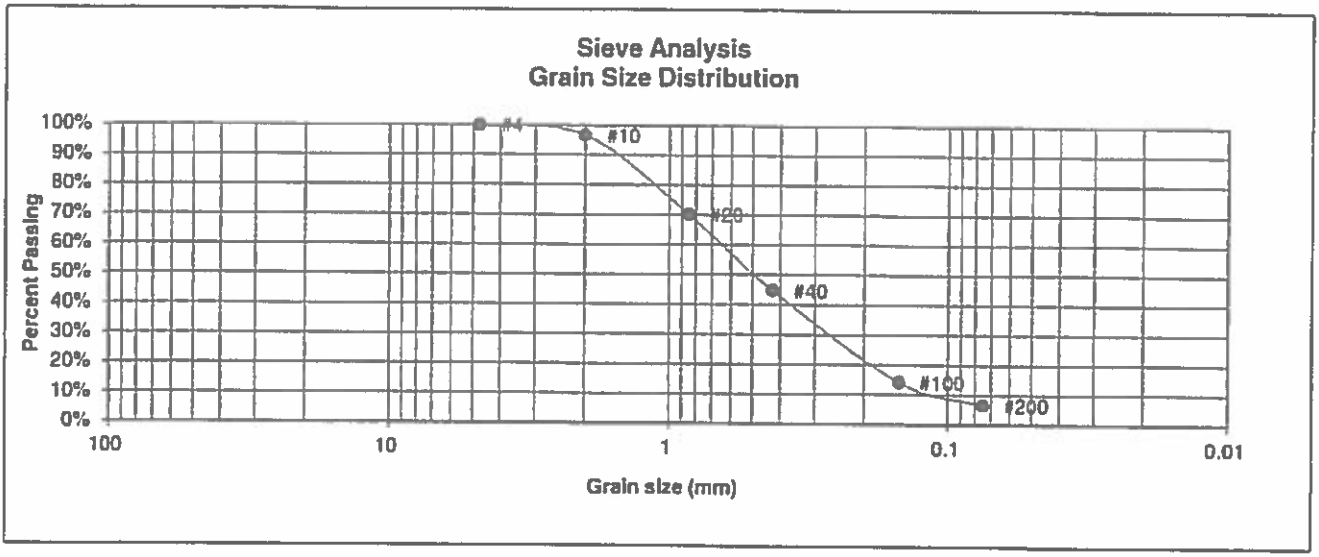
TEST PIT LOG

DRAWN:	DATE	CHECKED: LLL	DATE: 6/1/20

JOB NO 200989
FIG NO B-2

APPENDIX C: Laboratory Test Results

BORING NO.	TP-1	UNIFIED CLASSIFICATION	SM-SP	TEST BY	BL
DEPTH(ft)	2-3	AASHTO CLASSIFICATION		JOB NO.	200989
CLIENT	WILLIAM GUMAN				
PROJECT	McCLELLAND ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	96.7%
20	70.1%
40	44.8%
100	14.2%
200	6.6%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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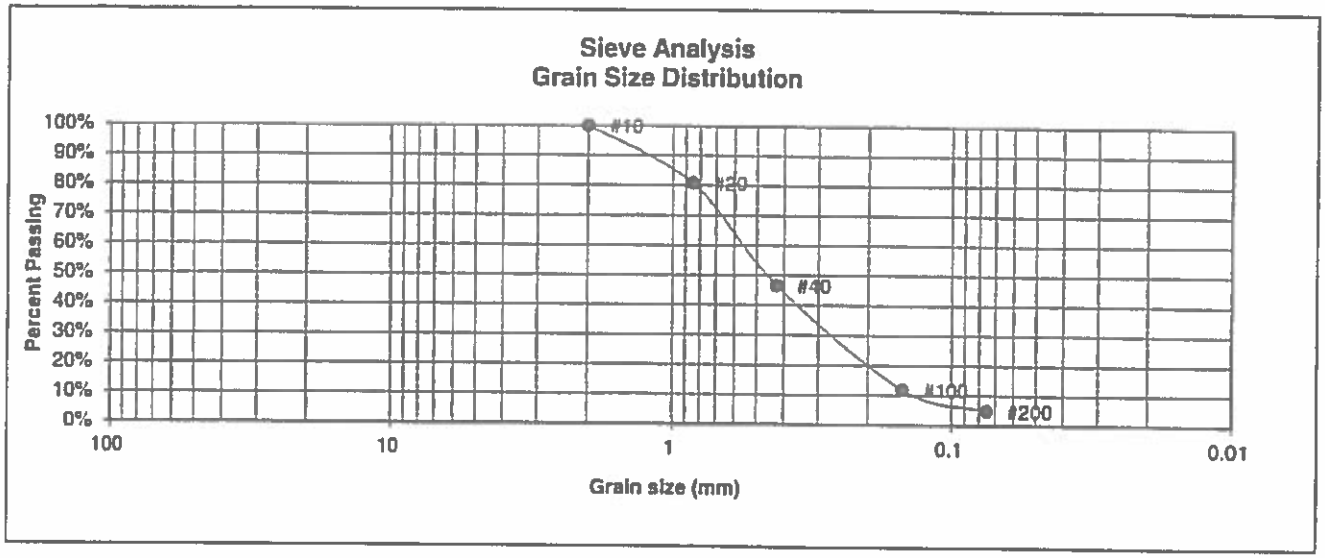
LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED:	DATE
		LLL	6/1/20

JOB NO 200989

FIG NO. C-1

BORING NO.	TP-1	UNIFIED CLASSIFICATION	SP	TEST BY	BL
DEPTH(ft)	6-8	AASHTO CLASSIFICATION		JOB NO.	200989
CLIENT	WILLIAM GUMAN				
PROJECT	McCLELLAND ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	80.8%
40	46.7%
100	11.9%
200	4.9%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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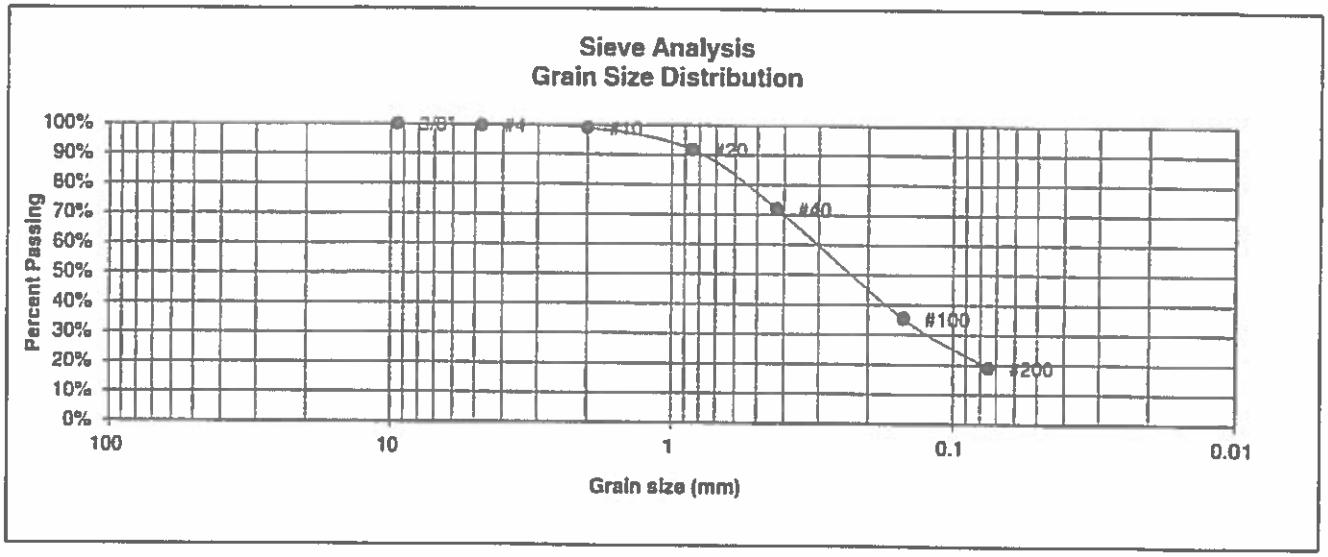
LABORATORY TEST RESULTS

DRAWN	DATE	CHECKED:	DATE
		LLL	6/1/20

JOB NO 200989

FIG NO C-2

BORING NO.	TP-2	UNIFIED CLASSIFICATION	SC	TEST BY	BL
DEPTH(ft)	2-3	AASHTO CLASSIFICATION		JOB NO.	200989
CLIENT	WILLIAM GUMAN				
PROJECT	McCLELLAND ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.7%
10	98.9%
20	91.8%
40	71.9%
100	35.4%
200	19.0%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

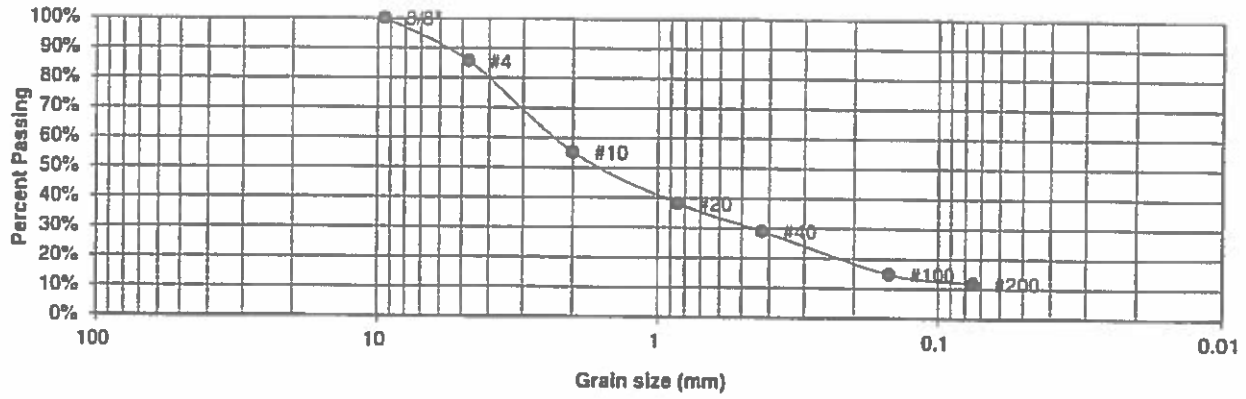
DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/1/20

JOB NO 200989

FIG NO C-3

BORING NO.	TP-2	UNIFIED CLASSIFICATION	SM-SW	TEST BY	BL
DEPTH(ft)	5-7	AASHTO CLASSIFICATION		JOB NO.	200989
CLIENT	WILLIAM GUMAN				
PROJECT	McCLELLAND ROAD				

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	85.6%
10	55.2%
20	38.2%
40	29.0%
100	14.8%
200	11.8%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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COLORADO SPRINGS, COLORADO 80907

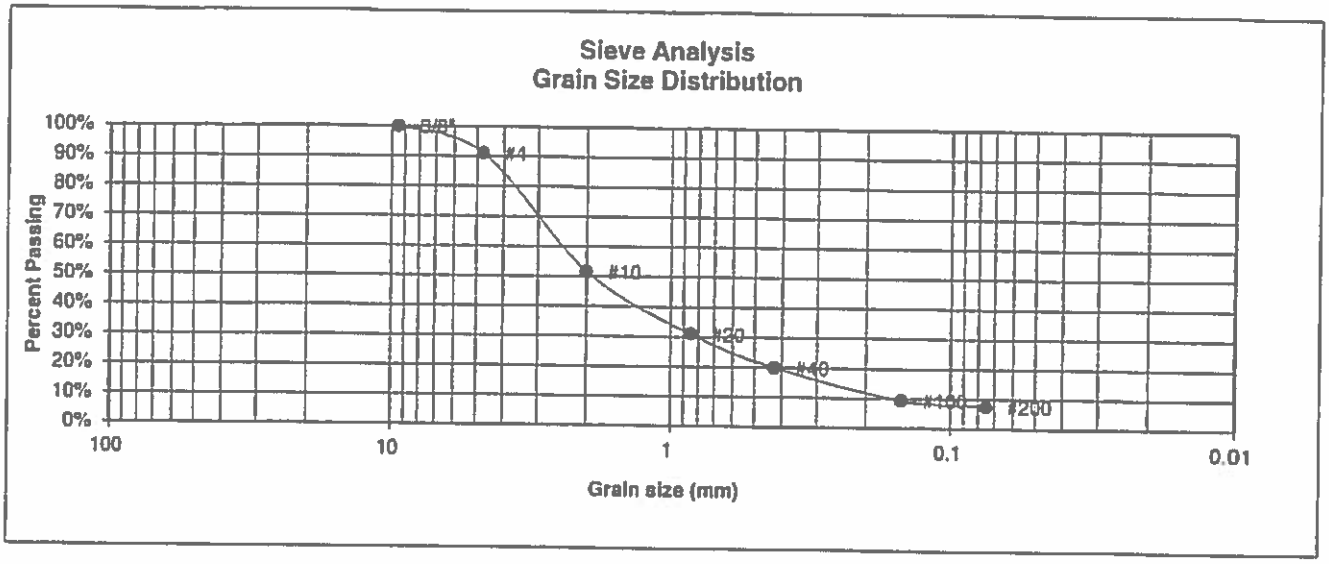
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/1/20

JOB NO 200989

FIG NO C-4

BORING NO.	TP-3	UNIFIED CLASSIFICATION	SM-SW	TEST BY	BL
DEPTH(ft)	2-3	AASHTO CLASSIFICATION		JOB NO.	200989
CLIENT	WILLIAM GUMAN				
PROJECT	McCLELLAND ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	91.1%
10	51.6%
20	31.0%
40	19.9%
100	9.4%
200	7.6%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

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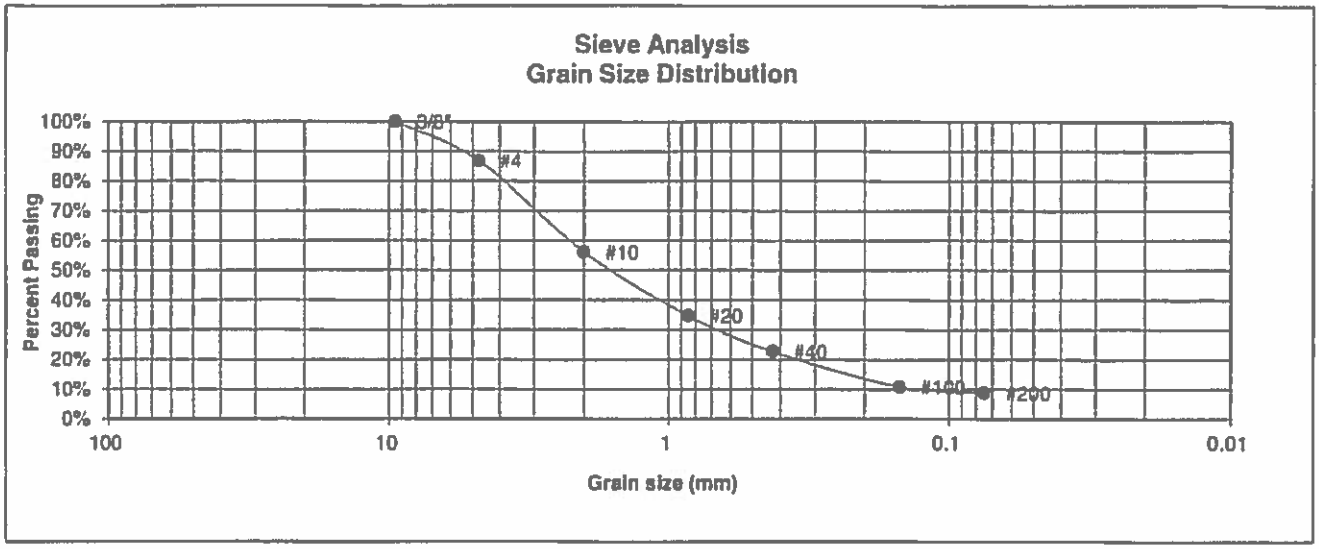
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LLL	6/1/20

JOB NO: 200989

FIG NO: L-5

BORING NO.	TP-3	UNIFIED CLASSIFICATION	SM-SW	TEST BY	BL
DEPTH(ft)	5-6	AASHTO CLASSIFICATION		JOB NO.	200989
CLIENT	WILLIAM GUMAN				
PROJECT	McCLELLAND ROAD				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	86.9%
10	56.1%
20	34.7%
40	22.7%
100	10.8%
200	8.8%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

Swell
Moisture at start
Moisture at finish
Moisture increase
Initial dry density (pcf)
Swell (psf)

ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, COLORADO 80907

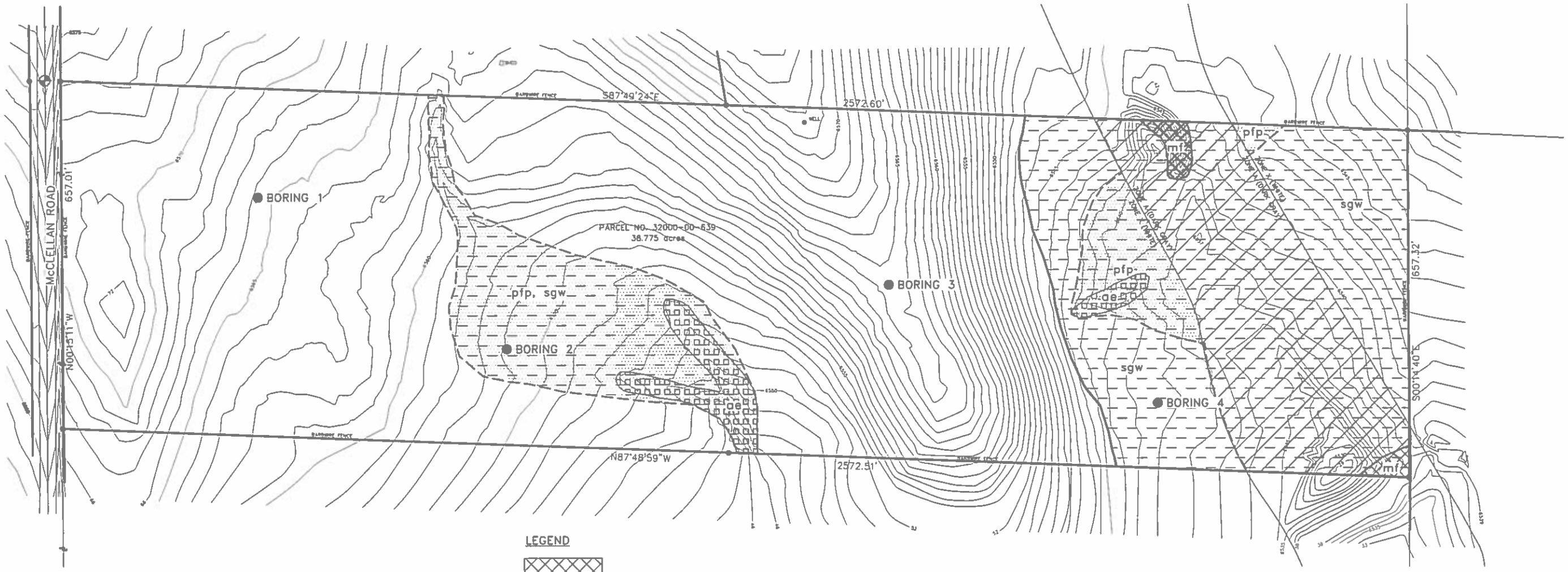
LABORATORY TEST RESULTS

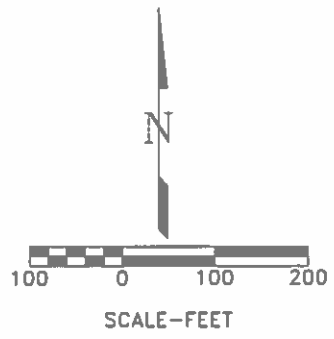
DRAWN	DATE	CHECKED:	DATE:
		LLL	6/1/20

JOB NO 200989

FIG NO C-6

APPENDIX D: Kumar Test Boring Logs and Laboratory Test Results





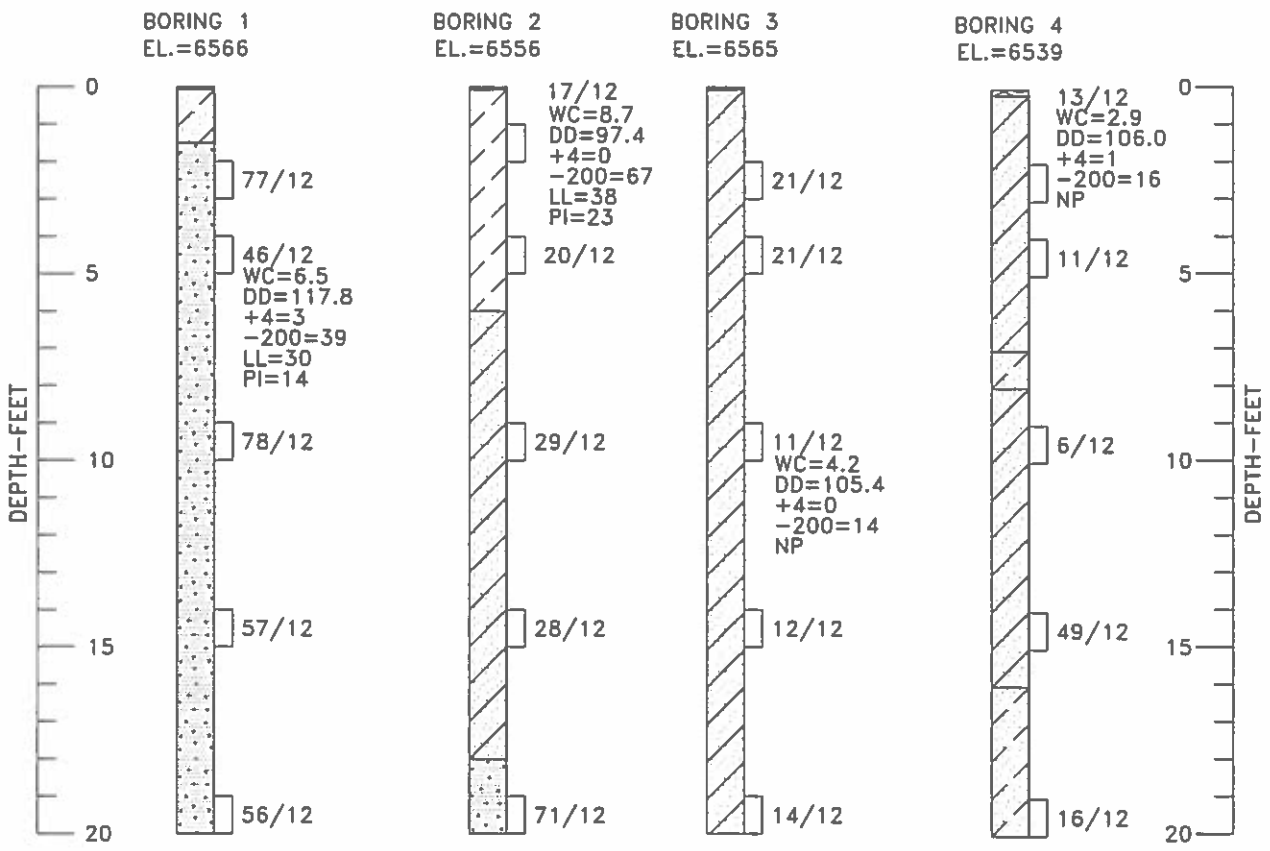
LEGEND

mf	MAN-PLACED FILL.
ZONE A	FEMA 100-YEAR FLOODPLAIN. THIS AREA SHOULD BE CONSIDERED A NO BUILD AREA UNLESS IT IS DETERMINED TO BE OUTSIDE OF THE 100-YEAR FLOODPLAIN DETERMINED BY A QUALIFIED HYDROLOGIST OR CIVIL ENGINEER.
pfp	POTENTIALLY FLOOD PRONE AREAS. THIS AREA SHOULD BE CONSIDERED A NO BUILD AREA UNLESS DETERMINED OTHERWISE BY A QUALIFIED HYDROLOGIST OR CIVIL ENGINEER.
sgw	AREA OF POTENTIALLY SHALLOW, GROUND-WATER TABLE.
ge	AREAS OF ACCELERATED EROSION AND ADVANCING GULLY HEADS.

NOTES:
1. BASE MAP AND FEMA FLOODPLAIN BOUNDARIES PROVIDED BY LDC-INC.
2. GEOLOGIC HAZARD MAP BASED ON CONDITIONS ENCOUNTERED DURING OUR FIELD RECCONNAISSANCE AND OUR SUBSURFACE EXPLORATION.

082-222	Kumar & Associates	MOUNTAINS EDGE DEVELOPMENT	GEOLOGIC HAZARD MAP	Fig. 3

Nov 13, 08Y - 16:37pm
C:\Drawings\2008\082-222\082-222_03.dwg



LEGEND

TOPSOIL.

CLAYEY SAND (SC), VERY STIFF, DRY TO MOIST, BROWN TO DARK BROWN.

SILTY SAND (SM), OCCASIONAL LAYERS OF POORLY- TO WELL-GRADED SAND WITH SILT (SP-SM, SW-SM), LOOSE TO DENSE, DRY TO MOIST, LIGHT BROWN TO BROWN.

SANDY LEAN CLAY (CL), OCCASIONALLY POROUS, VERY STIFF, DRY, LIGHT BROWN TO BROWN.

SANDSTONE BEDROCK, CLAYEY, NONCEMENTED, MEDIUM HARD TO HARD, DRY TO MOIST, LIGHT GRAYISH BROWN.

DRIVE SAMPLE, 2-INCH I.D. CALIFORNIA LINER SAMPLER.

77/12 DRIVE SAMPLE BLOW COUNT. INDICATES THAT 77 BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE THE SAMPLER 12 INCHES.

LABORATORY TEST RESULTS
WC = WATER CONTENT (%) (ASTM D 2216);
DD = DRY DENSITY (pcf) (ASTM D 2216);
+4 = PERCENTAGE RETAINED ON NO. 4 SIEVE (ASTM D 422);
-200 = PERCENTAGE PASSING NO. 200 SIEVE (ASTM D 1140);
LL = LIQUID LIMIT (ASTM D 4318);
PI = PLASTICITY INDEX (ASTM D 4318);
NP = NONPLASTIC (ASTM D 4318).

NOTES
1. THE EXPLORATORY BORINGS WERE DRILLED ON OCTOBER 21, 2008, WITH A 4-INCH DIAMETER CONTINUOUS FLIGHT POWER AUGER.
2. THE LOCATIONS OF THE EXPLORATORY BORINGS WERE MEASURED BY INSTRUMENT SURVEY PRIOR TO DRILLING AND WERE PROVIDED BY LDC-INC.
3. THE ELEVATIONS OF THE EXPLORATORY BORINGS WERE OBTAINED BY INTERPOLATION BETWEEN CONTOURS ON THE PLAN PROVIDED. THE LOGS OF THE EXPLORATORY BORINGS ARE PLOTTED TO DEPTH.
4. THE EXPLORATORY BORING LOCATIONS AND ELEVATIONS SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.
5. THE LINES BETWEEN MATERIALS SHOWN ON THE EXPLORATORY BORING LOGS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES AND THE TRANSITIONS MAY BE GRADUAL.
6. GROUND WATER WAS NOT ENCOUNTERED IN THE BORINGS AT THE TIME OF DRILLING, OR WHEN CHECKED THREE DAYS LATER. FLUCTUATIONS IN THE WATER LEVEL MAY OCCUR WITH TIME.

082-222	Kumar & Associates	MOUNTAINS EDGE DEVELOPMENT	LOGS OF EXPLORATORY BORINGS	Fig. 4

Kumar & Associates, Inc.

TABLE I

SUMMARY OF LABORATORY TEST RESULTS

Project No.: 082-222
Project Name: Mountains Edge Development
Date Sampled: 10/21/08
Date Received: 10/21/08

SAMPLE LOCATION		DATE TESTED	NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRADATION		PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		SOIL OR BEDROCK TYPE (Unified Soil Classification)
BORING	DEPTH (ft)				GRAVEL (%)	SAND (%)		LIQUID LIMIT	PLASTICITY INDEX	
1	4	10/22/08	6.5	117.8	3	58	39	30	14	Clayey sandstone
2	1	10/22/08	8.7	97.4	0	33	67	38	23	Sandy lean clay (CL)
3	9	10/22/08	4.2	105.4	0	86	14		NP	Silty sand (SM)
4	2	10/22/08	2.9	106.0	1	83	16		NP	Silty sand (SM)

APPENDIX E: Soil Survey Map & Descriptions

El Paso County Area, Colorado

8—Blakeland loamy sand, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 369v
Elevation: 4,600 to 5,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Blakeland and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blakeland

Setting

Landform: Hills, flats
Landform position (three-dimensional): Side slope, talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock and/or eolian deposits derived from sedimentary rock

Typical profile

A - 0 to 11 inches: loamy sand
AC - 11 to 27 inches: loamy sand
C - 27 to 60 inches: sand

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Available water storage in profile: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

El Paso County Area, Colorado

10—Blendon sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 3671
Elevation: 6,000 to 6,800 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 46 to 48 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Not prime farmland

Map Unit Composition

Blendon and similar soils: 98 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Blendon

Setting

Landform: Terraces, alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from arkose

Typical profile

A - 0 to 10 inches: sandy loam
Bw - 10 to 36 inches: sandy loam
C - 36 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 2 percent
Available water storage in profile: Moderate (about 6.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 1 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

El Paso County Area, Colorado

96—Truckton sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 36bf
Elevation: 6,000 to 7,000 feet
Mean annual precipitation: 14 to 15 inches
Mean annual air temperature: 46 to 50 degrees F
Frost-free period: 125 to 145 days
Farmland classification: Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60

Map Unit Composition

Truckton and similar soils: 95 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Truckton

Setting

Landform: Flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Arkosic alluvium derived from sedimentary rock and/or arkosic residuum weathered from sedimentary rock

Typical profile

A - 0 to 8 inches: sandy loam
Bt - 8 to 24 inches: sandy loam
C - 24 to 60 inches: coarse sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Low (about 5.7 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: A
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit: 4 percent
Hydric soil rating: No

Pleasant

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019

El Paso County Area, Colorado

97—Truckton sandy loam, 3 to 9 percent slopes

Map Unit Setting

National map unit symbol: 2x0j2
Elevation: 5,300 to 6,850 feet
Mean annual precipitation: 14 to 19 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 85 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

Truckton and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Truckton

Setting

Landform: Interfluves, hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Re-worked alluvium derived from arkose

Typical profile

A - 0 to 4 inches: sandy loam
Bt1 - 4 to 12 inches: sandy loam
Bt2 - 12 to 19 inches: sandy loam
C - 19 to 80 inches: sandy loam

Properties and qualities

Slope: 3 to 9 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline (0.1 to 1.9 mmhos/cm)
Available water storage in profile: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A

Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Minor Components

Blakeland

Percent of map unit: 8 percent
Landform: Interfluves, hillslopes
Landform position (two-dimensional): Shoulder, backslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Linear, convex
Across-slope shape: Linear, convex
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Bresser

Percent of map unit: 7 percent
Landform: Interfluves, low hills
Landform position (two-dimensional): Footslope, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Linear, concave
Across-slope shape: Linear, concave
Ecological site: Sandy Foothill (R049BY210CO)
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 17, Sep 13, 2019