



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
PHONE (719) 531-5599
FAX (719) 531-5238

December 7, 2021

Rockwood Homes
5436 Carvel Grove
Colorado Springs, CO 80922

Attn: Pat Hiner

Re: Wastewater Study
Trinity Subdivision
20040 Highway 94
Tax Schedule No. 34000-00-455
El Paso County, Colorado

Dear Mr. Hiner:

GENERAL SITE CONDITIONS AND PROJECT DESCRIPTION:

The site is located in the SE $\frac{1}{4}$ of Section 9, Township 14 South, Range 63 West of the 6th Principal Meridian in El Paso County, Colorado. The site is located approximately 12 $\frac{1}{2}$ miles east of Colorado Springs, Colorado, east of Peyton Highway and Highway 94 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 generally sloping to the southeast with a small north-south trending ridge in the western portion of the site. No drainages were observed on the site, but blowouts with low lying areas were located in portions of Lots 12, 25, 33, 44, and 45. The drainage swale flows in a westerly direction. 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, yucca and cacti. Site photographs, taken October 13, 2021, are included in Appendix A.

Total acreage involved in the proposed subdivision is 137.92-acres. Forty-eight rural, residential lots are proposed as part of the replat. The proposed lot sizes range in size but are approximately 2.5 to 3-acres. The lots will be serviced by individual on-site wastewater treatment systems and municipal water. The Site Plan is presented in Figure 3.

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 with regards to on-site wastewater treatment systems.

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Wastewater Study
Trinity Ranch Subdivision
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FIELD INVESTIGATION

Our field investigation consisted of the preparation of a geologic map of bedrock features and significant surficial deposits. The Natural Resource Conservation Service (NRCS) (Reference 2), previously the Soil Conservation Service (SCS) survey was also reviewed to evaluate the site (Reference 3). The position of mappable units within the subject site are shown on the Geologic Map Figure, 6. Our mapping procedures involved both field reconnaissance and measurements, and aerial photo reconnaissance and interpretation. The field mapping was performed by personnel of Entech Engineering, Inc. on October 13, 2021.

Ten (10) test pits were excavated on the site to determine general suitability of the soil characteristics for residential construction and on-site wastewater treatment systems. The locations of the test pits are indicated on the Site Plan/Test Boring Location Map, Figure 3. The Test Pit Logs are presented in Appendix B, and Laboratory Testing results are included in Appendix C.

SOIL AND GEOLOGIC CONDITIONS:

Soil Survey

The Natural Resource Conservation Service (NRCS) (Reference 2, Figure 4), previously the Soil Conservation Service (Reference 3) has mapped four soil types on the site. Complete descriptions of the soils are presented in Appendix D. In general, the soils consist of loamy sand and sandy loam. The soils are described as follows:

Type	Description
8	Blakeland Loamy Sand, 1 – 9% Slopes
95	Truckton Loamy Sand, 1 – 9% 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 home sites. 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

Two soil types were encountered in the test pits on the site. Type 1: silty sand (SM), and Type 2: sandy silt. Bedrock was not encountered in the test pits. Each soil type was classified in accordance with the Unified Soil Classification System (USCS) using the laboratory testing results.

Soil Type 1 classified as silty sand (SM). The sand was encountered in all of the test borings and Test Pits 1 through 9 at the existing ground surface extending to the termination of test borings (20 feet), and the test pits (8 feet). Standard Penetration Testing on the sand resulted in N-values

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of 3 to 30 bpf indicating medium dense to dense states. The majority of the sands were encountered at medium dense states. Water content and grain size testing resulted in approximately 2 to 11 percent water content with 3 to 48 percent of the soil size particles passing the No. 200 sieve.

Soil Type 2 classified as sandy silt (ML). The sandy silt was encountered in Test Pit No. 10 at the existing ground surface and extended to termination of the test pit (8 feet bgs). Grain size testing resulted in approximately 80 percent of the soil size particles passing the No. 200 sieve.

Soils encountered in the test pits excavated by Entech Engineering, Inc. consisted of sandy loam to sandy clay. Bedrock or signs of groundwater were not encountered in the test pits which were excavated to depths of 8 feet.

Groundwater

Groundwater was not encountered in the test borings or test pits at the time of our site investigation. It should be noted that fluctuation in groundwater levels could change due to seasonal variations, changes in land runoff characteristics and future development of nearby areas. 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 during construction.

Drainage Areas/Floodplains

The site does not lie within a mapped floodplain zone according to the FEMA Map Nos. 08041CO805G dated December 7, 2018 (Figure 7, Reference 6). Finished floor levels must be a minimum of one foot above any floodplain level. Exact locations of floodplain and specific drainage studies are beyond the scope of this report. No drainages were observed on the site and surface flows are anticipated to be to the south.

Potentially Seasonal Shallow Groundwater Area

Blowouts associated with the windblown sands are located in some areas across the site and that have been mapped as potentially seasonally shallow groundwater areas and are discussed in the following section. These low-lying areas are indicated in the Geology/Engineering Geology Map (Figure 6). Due to the lot sizes these areas can be avoided. Lots affected by the potentially seasonal shallow groundwater are Lots 12, 25, 33, 44, and 45. In these areas, we would anticipate the potential for periodically high subsurface moisture conditions, frost heave potential and highly organic soils.

Geology

Approximately 22½ miles west of the site is the southern extent of 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). Overlying the Dawson Formation are deposits of man-made fill soils and alluvial deposited sands and clays.

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The geology of the site was evaluated using the *Geologic Map of Pueblo 1-degree x 2degrees' quadrangle, South-Central Colorado*, by Scott, G.R., et.al. in 1976, (Reference 4). The Geology Map for the site is presented in Figure 6. One mappable unit was identified on this site which is described as follows:

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.

The soils listed above were mapped from site-specific mapping, the *Geologic map of the Pueblo 1-degree x 2-degrees' quadrangle, south-central Colorado* published by the U.S. Geologic Survey in 1976 (Reference 4). The test borings and 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.

ON-SITE WASTEWATER TREATMENT

The Natural Resource Conservation Service (Reference 2), previously the Soil Conservation Service (Reference 3) has mapped this site with four soil descriptions. The Soil Survey Map (Reference 3) is presented in Figure 4, and the Soil Survey Descriptions (Reference 3) are presented in Appendix E. The soils are described as having moderate to rapid percolation rates.

Soils encountered in the tactile test pits consisted of sandy loam, sandy clay loam, and sandy clay. The limiting layer encountered in the test pits is the clay to sandy clay soils, which corresponds with USDA Soil Type 2 to 4A with an LTAR values ranging from 0.6 to 0.2 gallons per day per square foot, respectively. Signs of bedrock and seasonally occurring bedrock were not observed in the test pits but can be encountered in this area. Absorption fields must be maintained a minimum of 4 feet above any groundwater, groundwater evidence, bedrock, or confining layers. Should groundwater or bedrock be encountered within 6 feet of the surface, designed systems will be required. Conventional systems are anticipated for the majority of the lots in this subdivision.

In summary, it is our opinion the site is suitable for individual on-site wastewater treatment systems (OWTS) and that contamination of surface and subsurface water resources should not occur provided the OWTS sites are evaluated and installed according to El Paso County and State Guidelines and properly maintained. Based on the testing performed, conventional systems would likely be appropriate for the majority of the lots, some lots may require designed systems. The Septic Suitability Map is presented in Figure 8. Possible house locations and two septic sites for the lots are indicated on Figure 8. The subdivision is anticipated to be supplied by central water. Areas that should be avoided by septic systems are indicated on the septic suitability map.

Individual soil testing is required for proposed construction on each lot prior to construction. Absorption fields must be located a minimum of 100 feet from any well, including those on adjacent properties. Absorption fields must also be located a minimum of 50 feet from any drainages, floodplains or ponded areas and 25 feet from dry gulches.

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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 will be provided when investigations are completed at each building site prior to new construction.

This report has been prepared for Rockwood Homes, for application to the proposed project in accordance with generally accepted geologic soil and engineering practices. No other warranty expressed or implied is made.

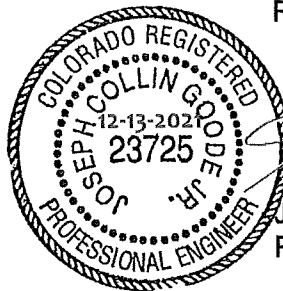
We trust that this report has provided you with all the information that you required. Should you require additional information, please do not hesitate to contact Entech Engineering, Inc.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Reviewed by:


Logan L. Langford, P.G.
Geologist




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

LLL/jhr

Encl.

Entech Job No. 212655
AAprojects/2021/212655 wws

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Wastewater Study
Trinity Ranch Subdivision
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Tax Schedule No. 34000-00-455
El Paso County, Colorado

BIBLIOGRAPHY

1. Natural Resource Conservation Service, September 13, 2019. *Web Soil Survey*. United States Department Agriculture, <http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>.
2. United States Department of Agriculture Soil Conservation Service. June 1981. *Soil Survey of El Paso County Area, Colorado*.
3. Scott, G.R., Taylor R.B, Epis, R.C., and Wobus, R.A., 1976. Geologic map of the Pueblo 1-degree x 2-degrees' quadrangle, south-central Colorado. USGS, Map MF-775.
4. Federal Emergency Management Agency. December 7, 2018. *Flood Insurance Rate Maps for the City of Colorado Springs, Colorado*. Map Number 08041CO805G.
5. El Paso County Planning Development. December 1995. *El Paso County Aggregate Resource Evaluation Maps*.
6. Schwochow, S.D.; Shroba, R.R. and Wicklein, P.C. 1974. *Atlas of Sand, Gravel, and Quarry Aggregate Resources, Colorado Front Range Counties*. Colorado Geological Survey. Special Publication 5-B.
7. Keller, John W.; TerBest, Harry and Garrison, Rachel E. 2003. *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands Administered by the Colorado State Land Board*. Colorado Geological Survey. Open-File Report 03-07.

TABLES

TABLE 1
SUMMARY OF LABORATORY TEST RESULTS

CLIENT ROCKWOOD HOMES
PROJECT 20040 HIGHWAY 94
JOB NO. 212655

SOIL TYPE	TEST BORING NO.	DEPTH (FT)	WATER (%)	DRY DENSITY (PCF)	PASSING NO. 200 SIEVE (%)	LIQUID LIMIT (%)	PLASTIC INDEX (%)	SULFATE (WT %)	FHA SWELL (PSF)	SWELL/ CONSOL (%)	UNIFIED CLASSIFICATION	SOIL DESCRIPTION
1	TP-1	3.5			48.4						SM	SAND, VERY SILTY
1	TP-3	3			19.0						SM	SAND, SILTY
1	TP-5	6.5			19.5			<0.01			SM	SAND, SILTY
1	TP-7	2.5			18.0						SM	SAND, SILTY
1	TP-9	6.5			21.4						SM	SAND, SILTY
2	TP-10	3.5			80.4						ML	SILT, SANDY

Table 2: Summary Tactile Test Pit Results

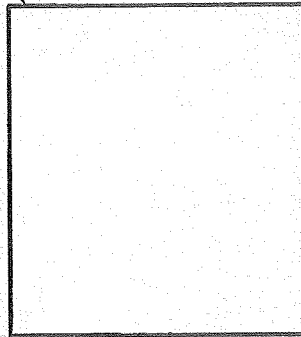
Test Pit No.	USDA Soil Type	LTAR Value	Depth to Bedrock (ft.)	Depth to Seasonally Occurring Groundwater (ft.)
1	3	0.35	N/A	N/A
2	2	0.60	N/A	N/A
3	3	0.35	N/A	N/A
4	3	0.35	N/A	N/A
5	3	0.35	N/A	N/A
6*	3A*	0.30*	N/A	N/A
7	3	0.35	N/A	N/A
8	3	0.35	N/A	N/A
9	3	0.35	N/A	N/A
10*	4A*	0.20*	N/A	N/A

*- Conditions that will require an engineered OWTS

FIGURES

Manisa Ranch
Suri Alpacas

SITE



94

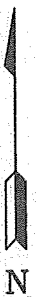
Peyton Hwy

94

S Peyton Hwy

38°51'06.2"N, 104°23'24.1"W (38.85173, -104.39004)

2000 ft



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VICINITY MAP
TRINITY RANCH
20040 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: ROCKWOOD HOMES

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LLL

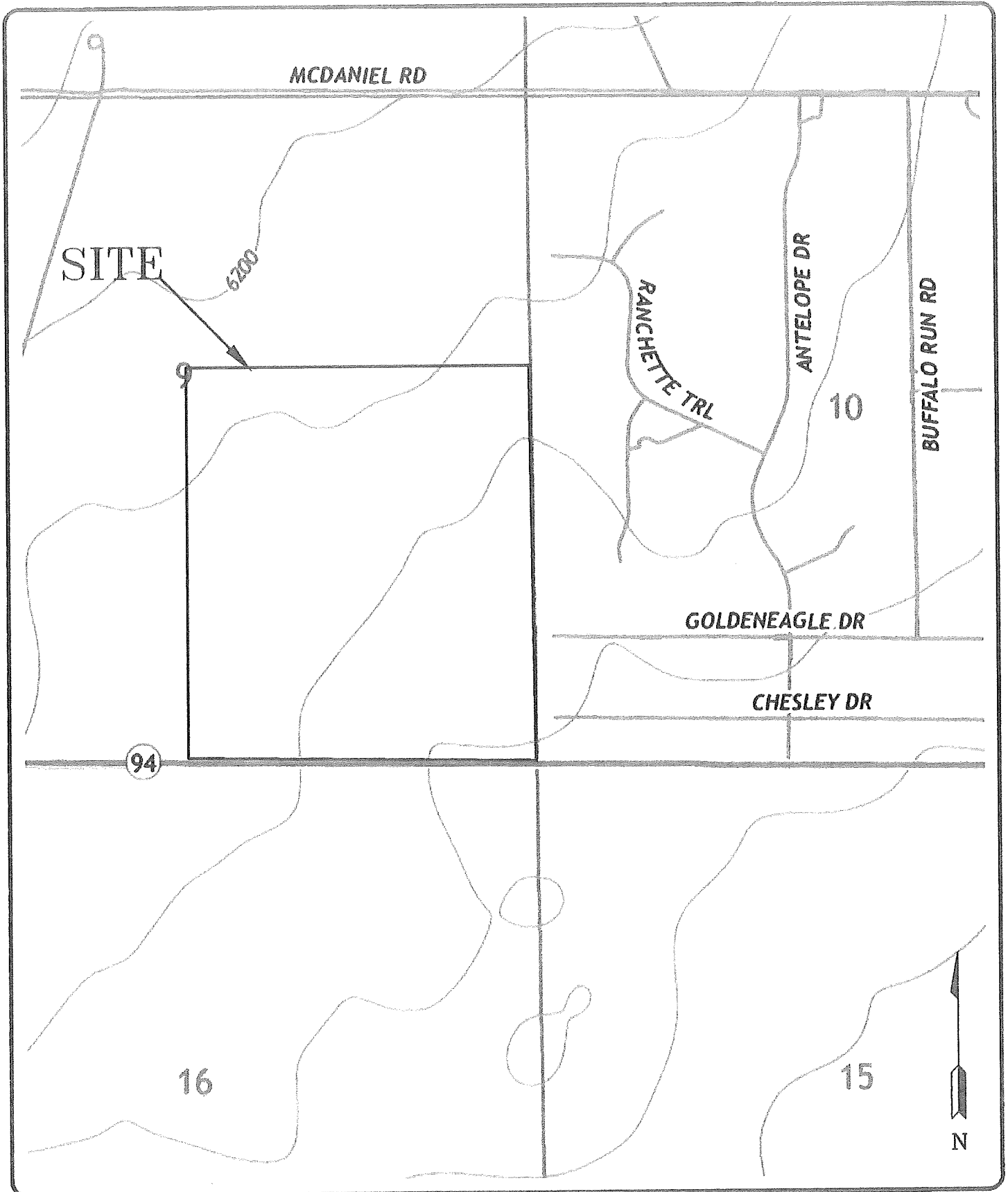
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11/17/21

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DATE:

JOB NO.:
212655

FIG NO.:
1



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USGS MAP TOPOGRAPHY MAP
TRINITY RANCH
20040 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: ROCKWOOD HOMES

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LLL

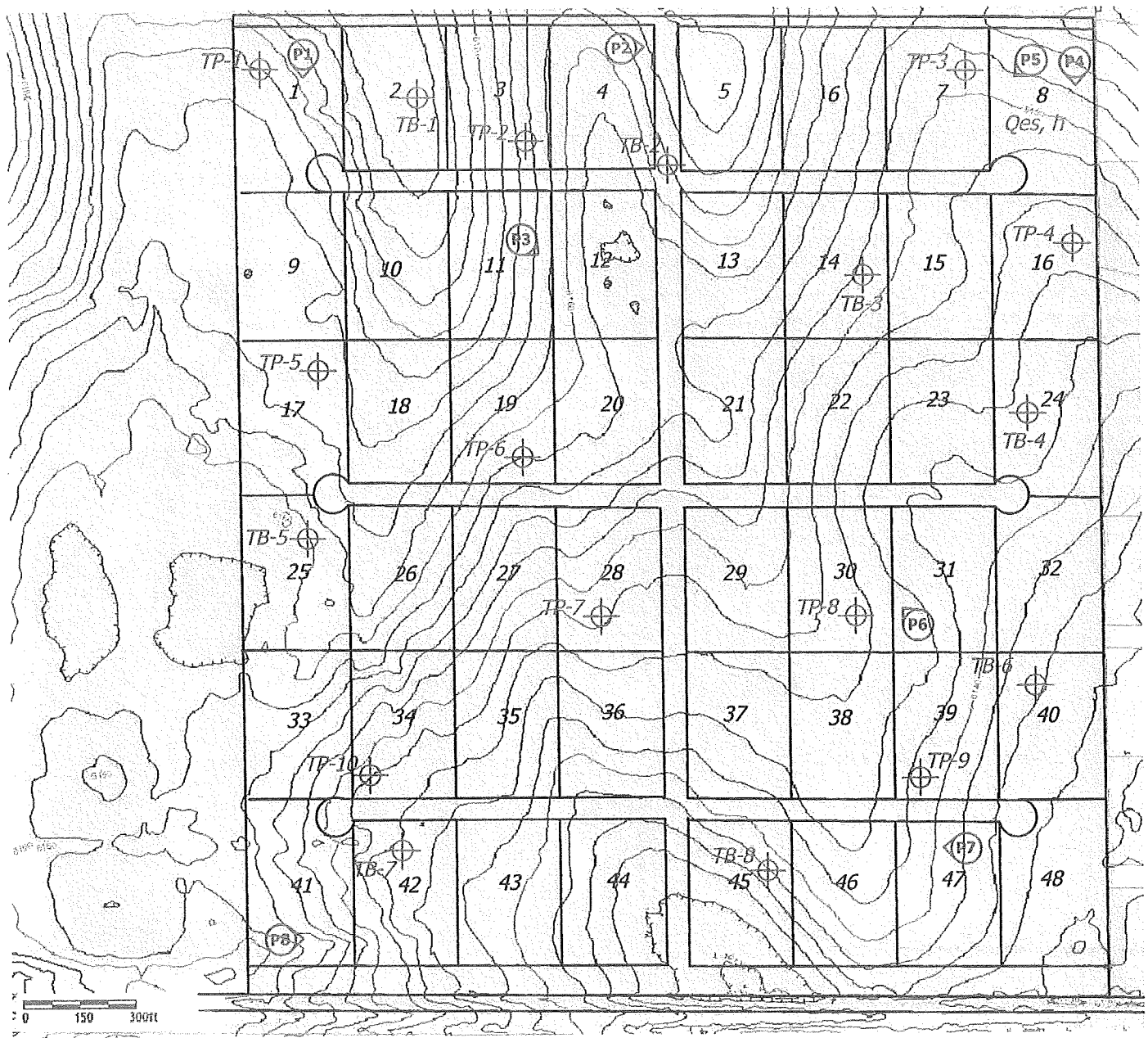
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212655

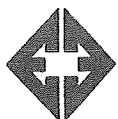
FIG NO.:
2



APPROXIMATE TEST BORING LOCATION



APPROXIMATE PHOTOGRAPH LOCATION AND DIRECTION



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SITE PLAN/TESTING LOCATION MAP
TRINITY RANCH
20040 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: ROCKWOOD HOMES

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LLL

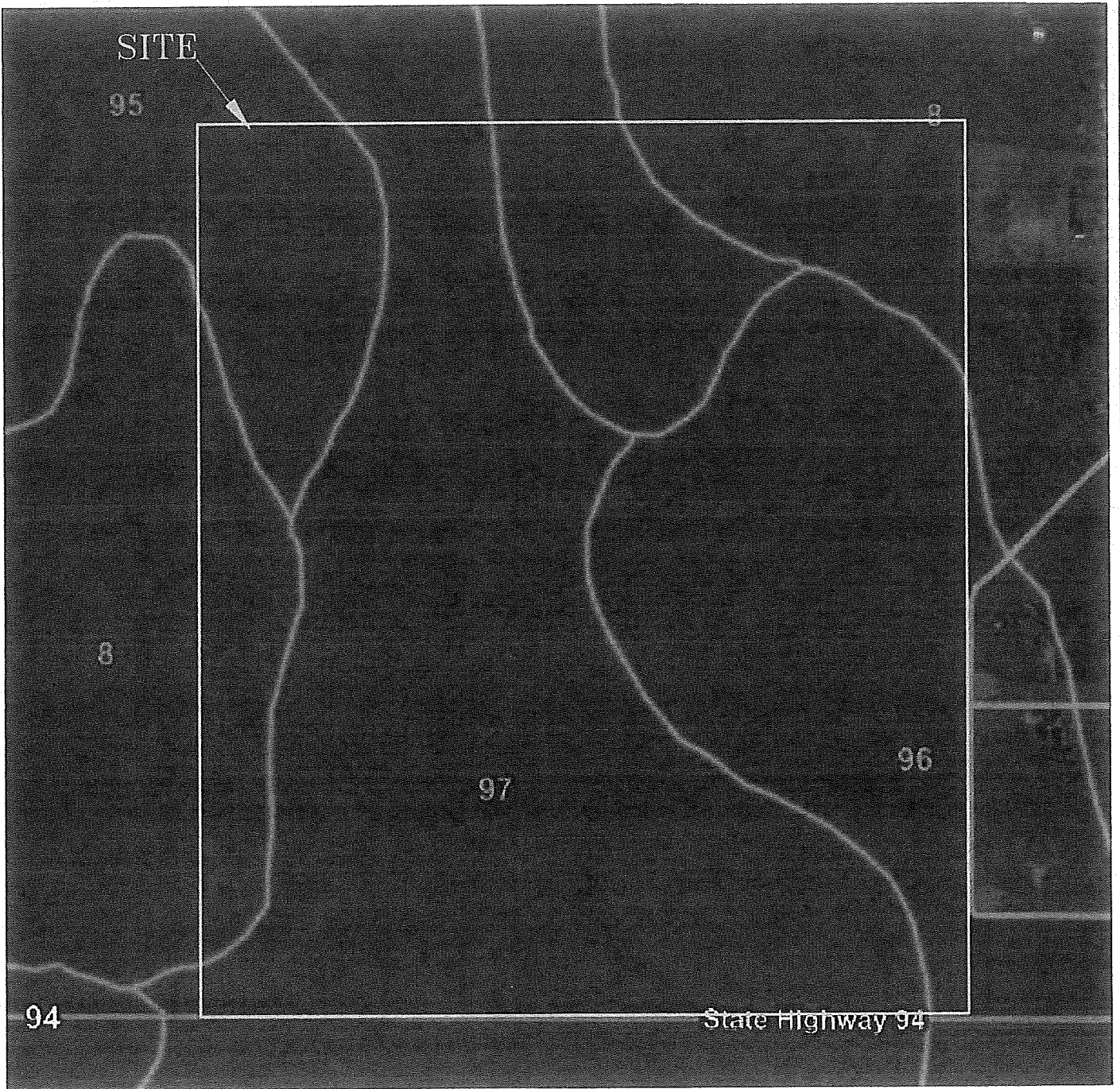
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JOB NO.:
212655

FIG NO.:
3



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SOIL SURVEY MAP
TRINITY RANCH
20040 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: ROCKWOOD HOMES

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LLL

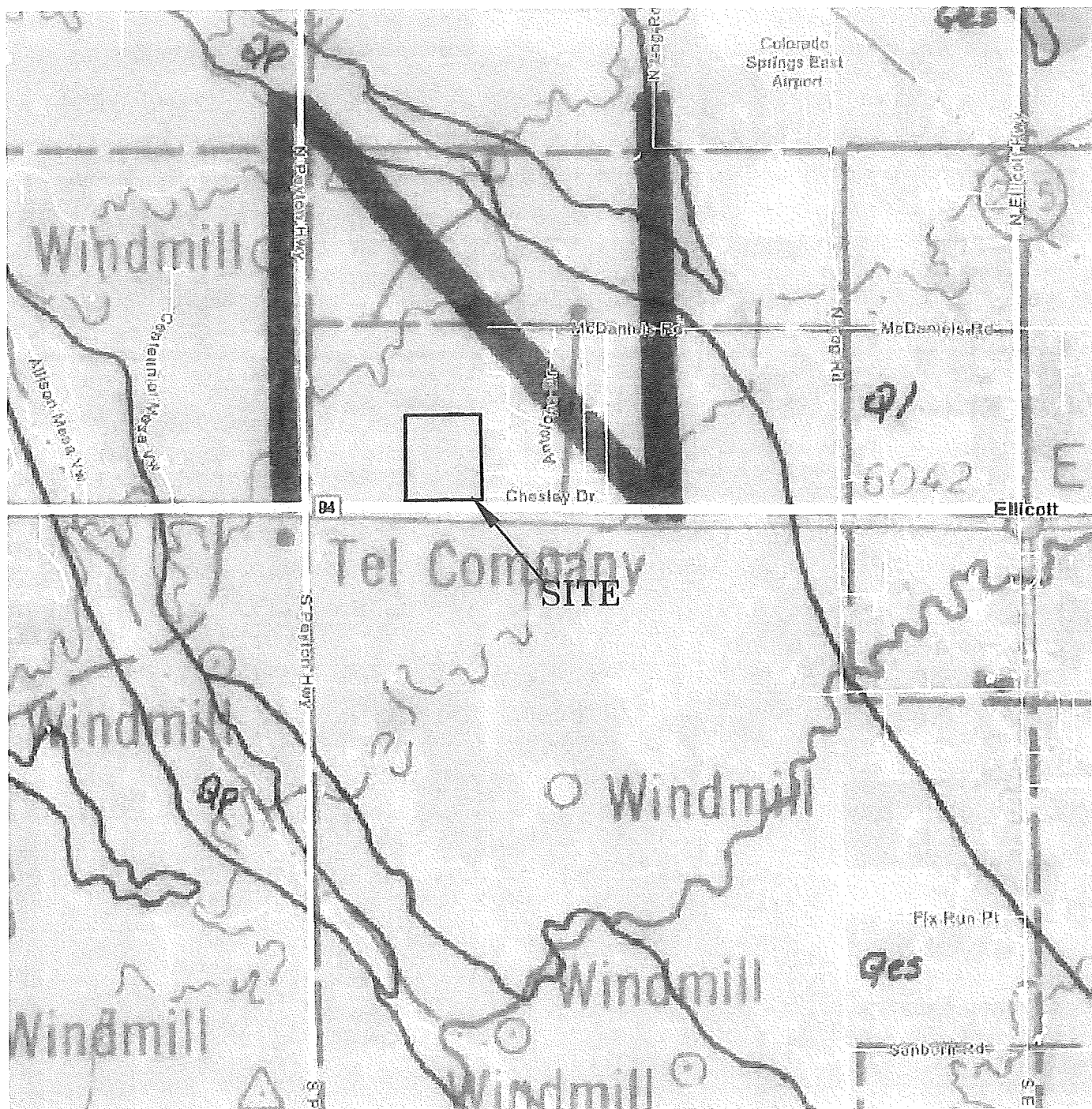
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JOB NO.:
212655

FIG NO.:
4



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GEOLOGIC MAP OF THE PUEBLO 1° X 2° QUADRANGLE
TRINITY RANCH
20040 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: ROCKWOOD HOMES

DRAWN:
LLL

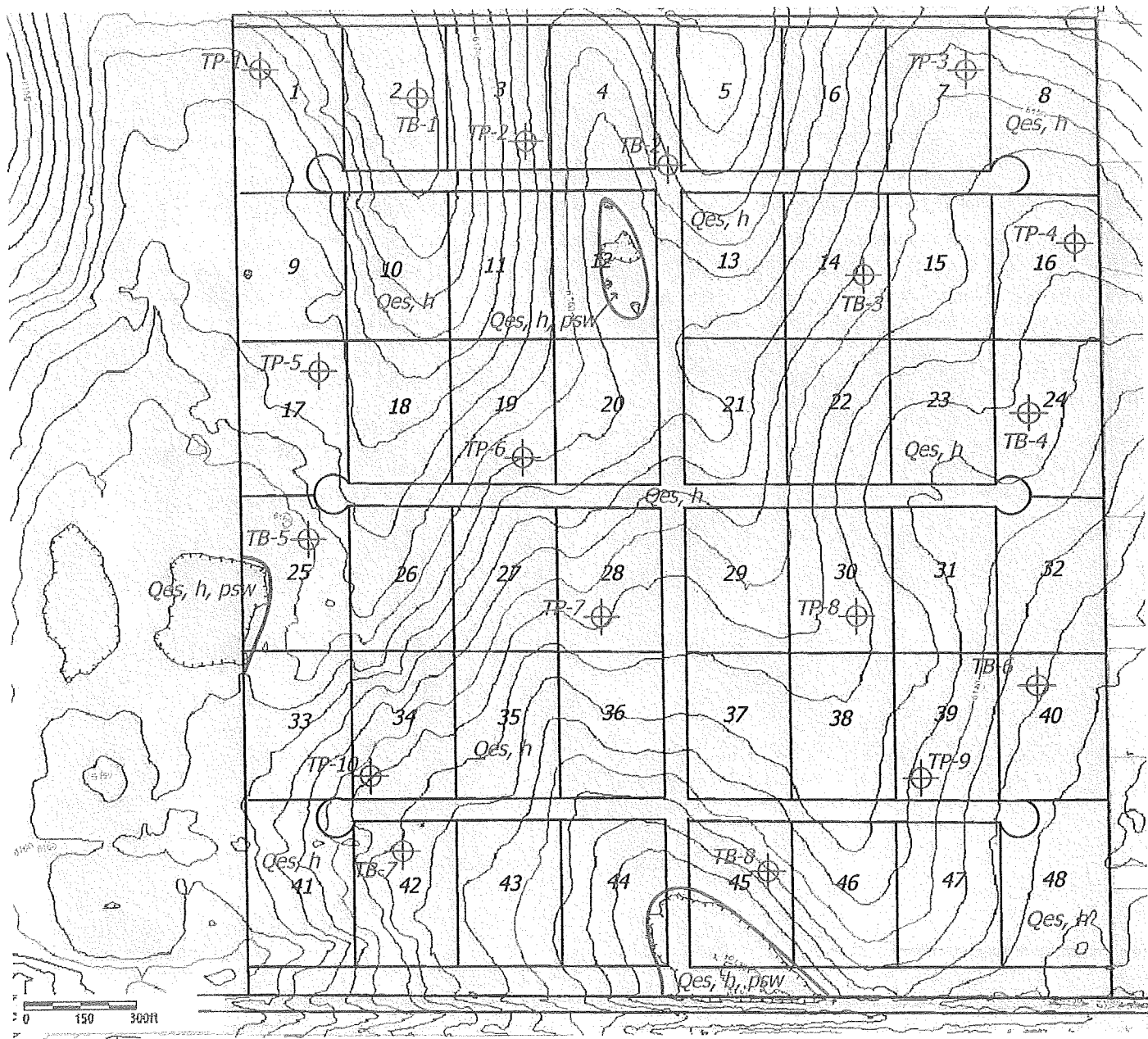
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11/17/21

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DATE:

JOB NO.:
212655

FIG NO.:
5



Legend

Qes - Eolian Sands of Quaternary Age.
wind blown sediments

h - hydrocompactive soil
psw - potentially seasonally shallow groundwater area



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GEOLOGY/ENGINEERING GEOLOGY MAP
TRINITY RANCH
20040 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: ROCKWOOD HOMES

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212655

FIG NO.:
6

SITE

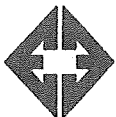
08041C0805G
eff. 12/7/2018

600ft

-104.44638841 Degrees



N



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FEMA FLOODPLAIN MAP
TRINITY RANCH
20040 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: ROCKWOOD HOMES CO.

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DATE:
11/17/21

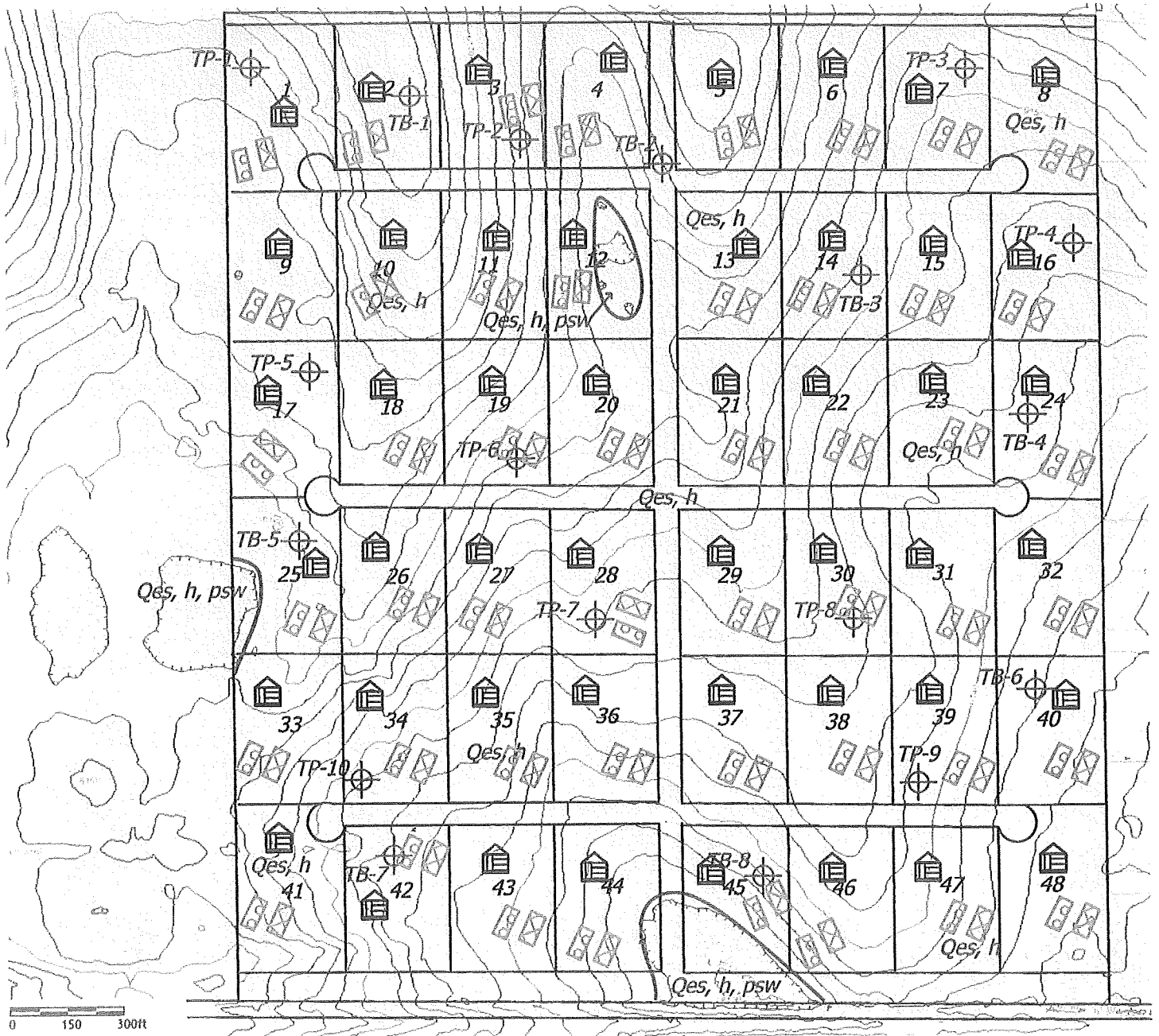
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212655

FIG NO.:
7

APPENDIX A: Photographs



LEGEND:



- POSSIBLE OWTS LOCATIONS



- POSSIBLE OWTS ALTERNATE LOCATIONS



- POSSIBLE HOUSE LOCATIONS

- OWTS ARE NOT RECOMMENDED IN AREAS OF
POTENTIALLY SEASONAL SHALLOW GROUNDWATER (PSW)

N



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OWTS SUITABILITY MAP
TRINITY RANCH
20040 HIGHWAY 94
EL PASO COUNTY, CO.
FOR: ROCKWOOD HOMES

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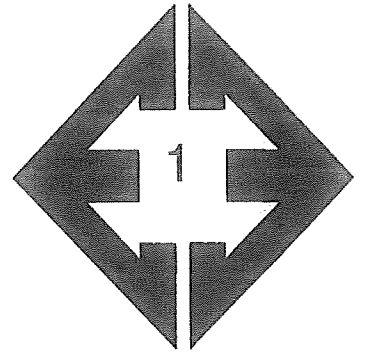
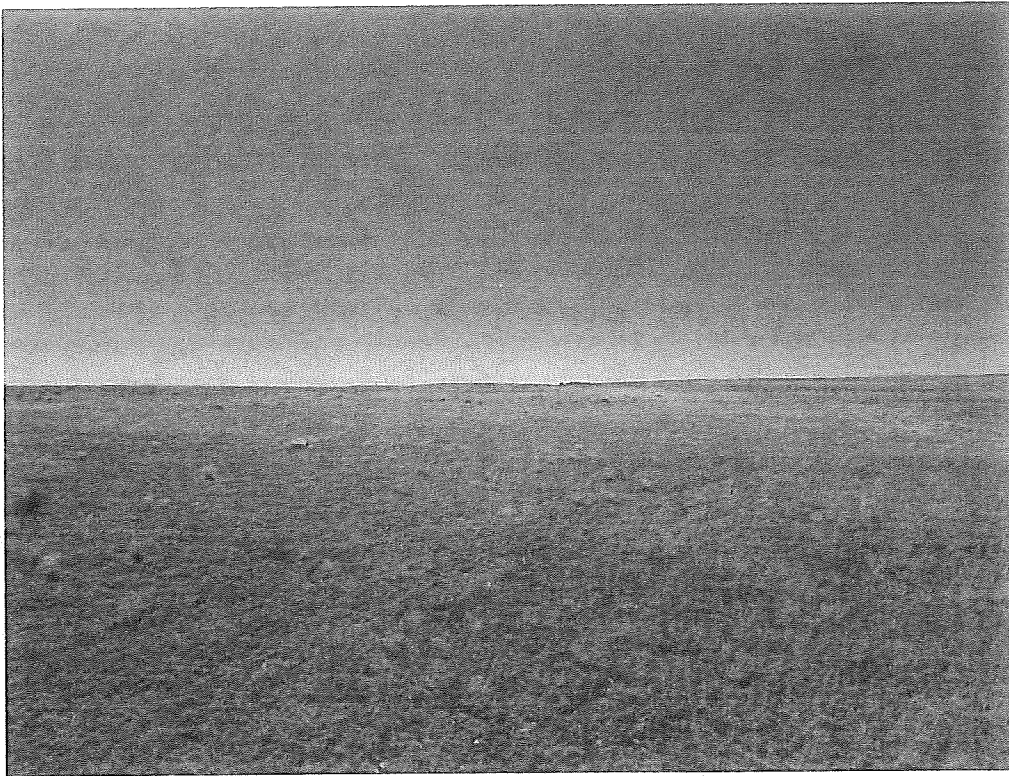
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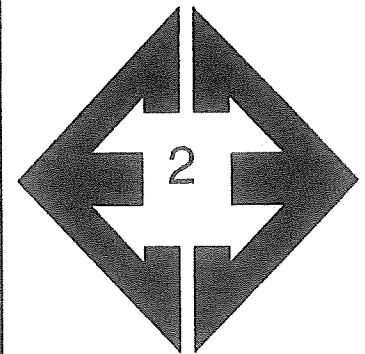
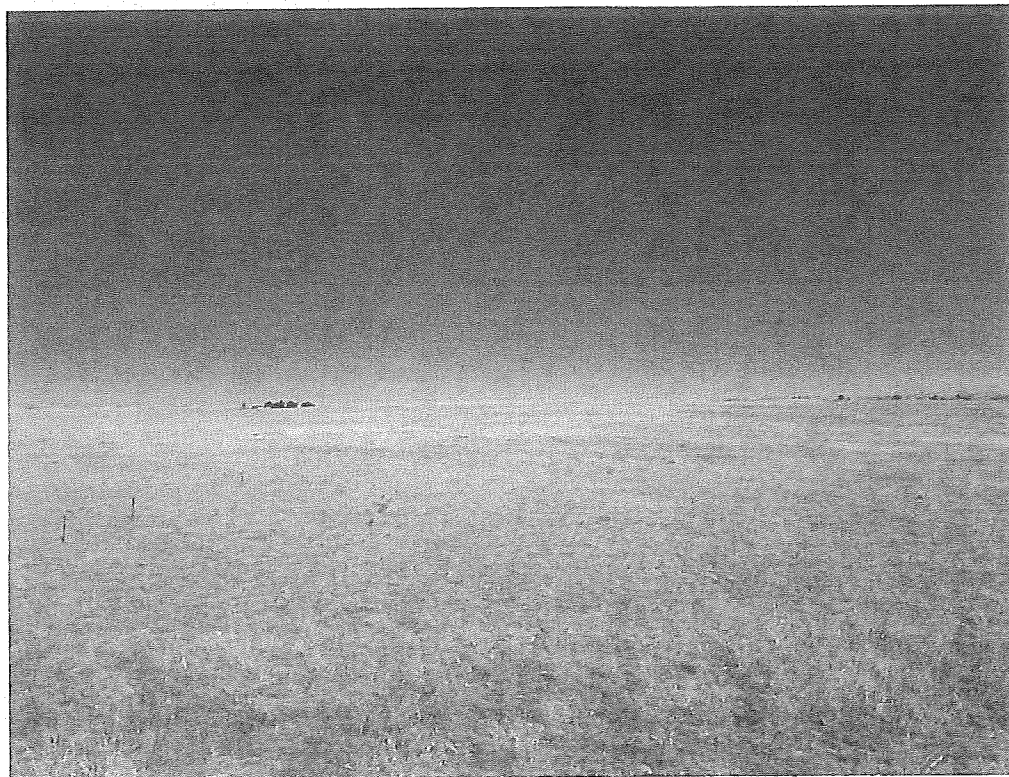
JOB NO.:
212655

FIG NO.:
8



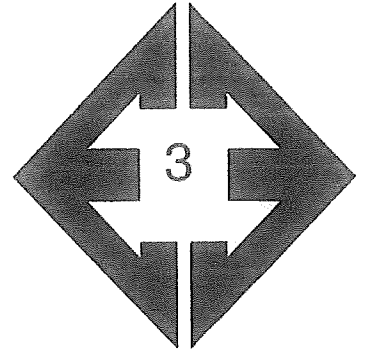
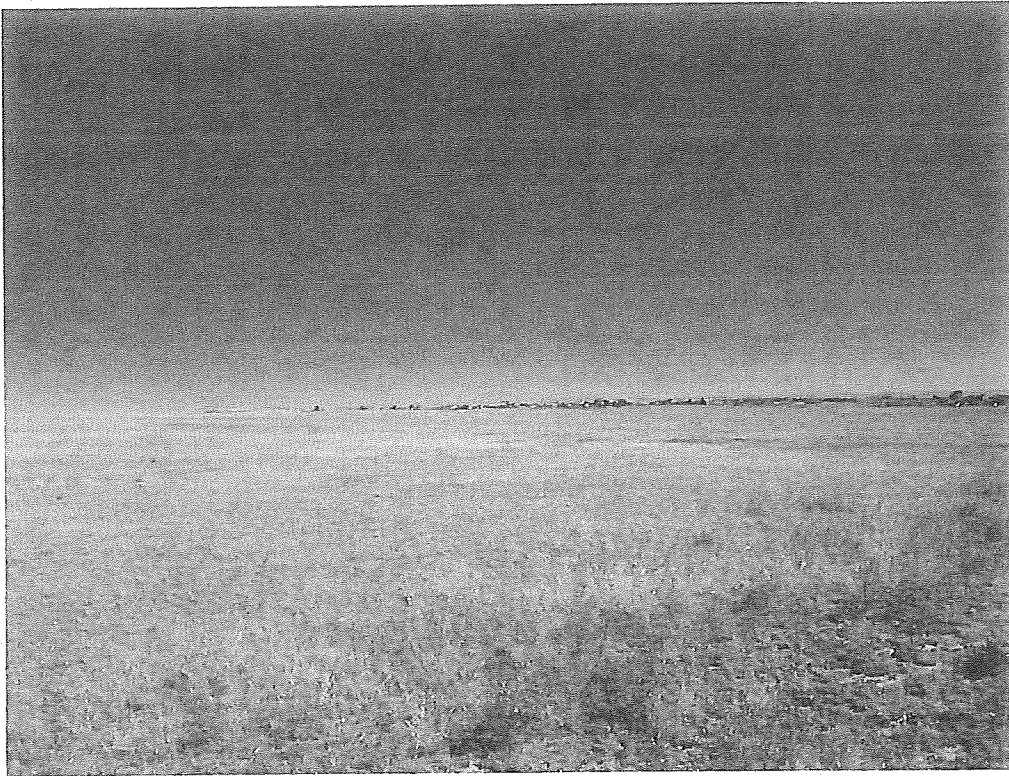
**Looking south from
the northeastern
corner of the site.**

October 13, 2021



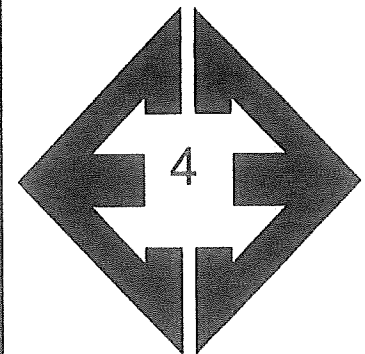
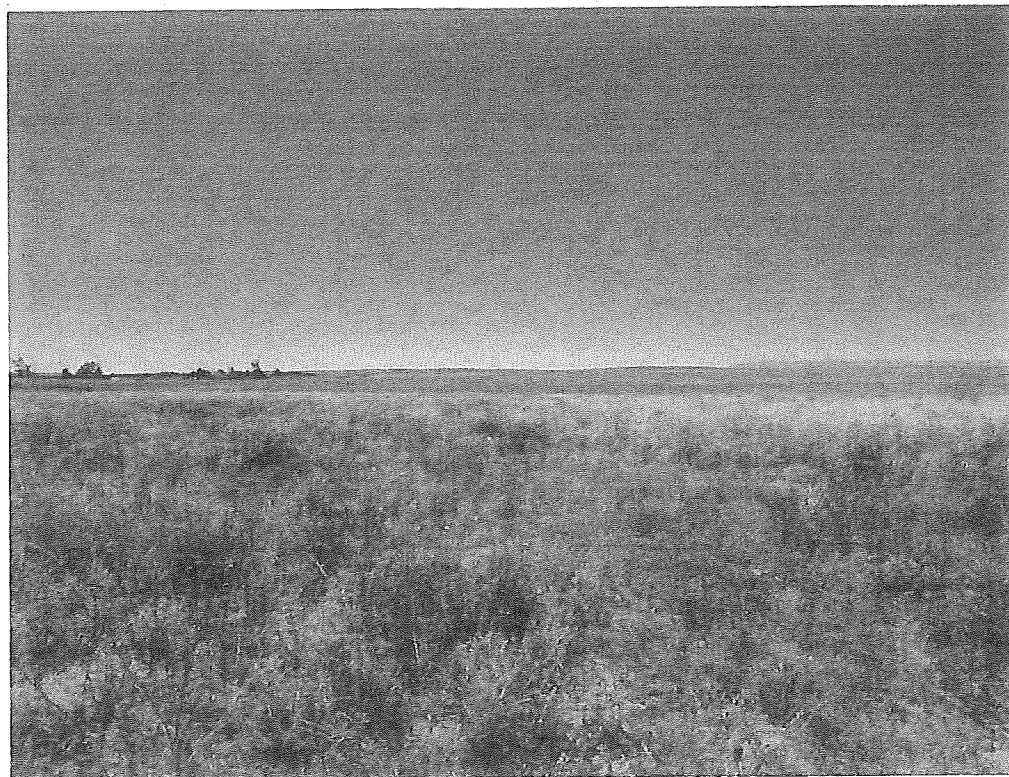
**Looking east from the
northern side of the
site.**

October 13, 2021



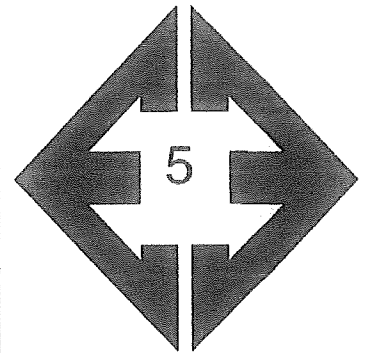
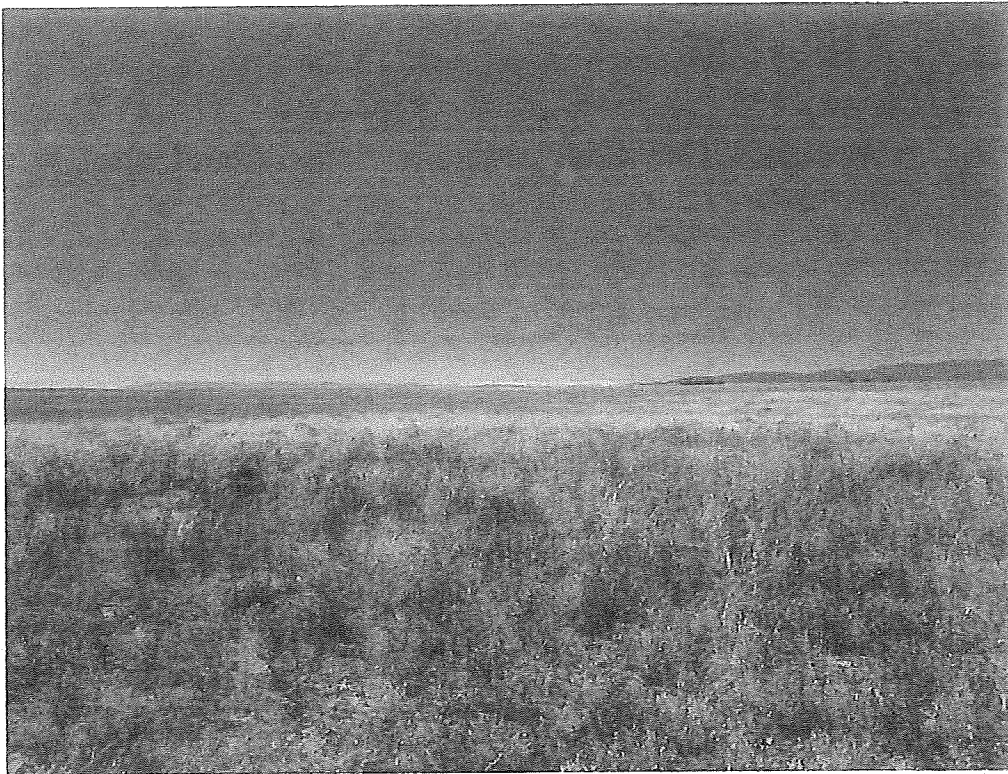
**Looking southeast
from the north-central
portion of the site.**

October 13, 2021



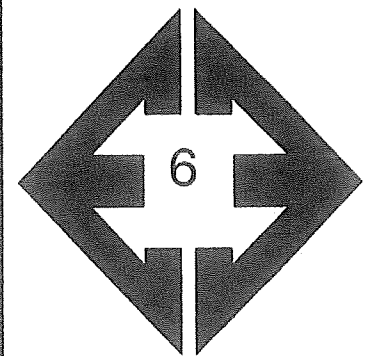
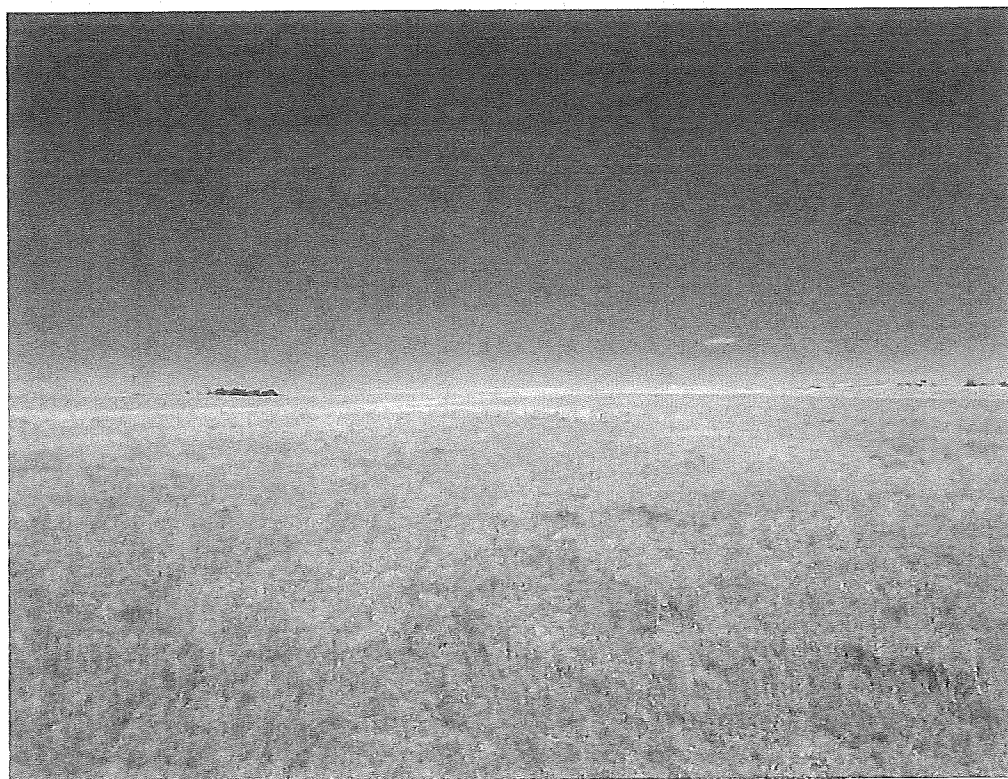
**Looking west from the
northeastern portion of
the site.**

October 13, 2021



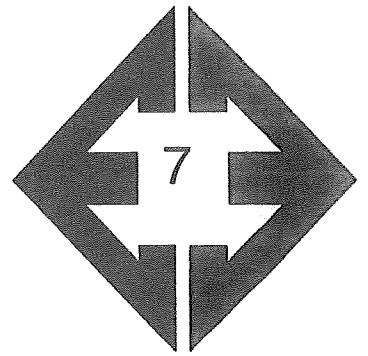
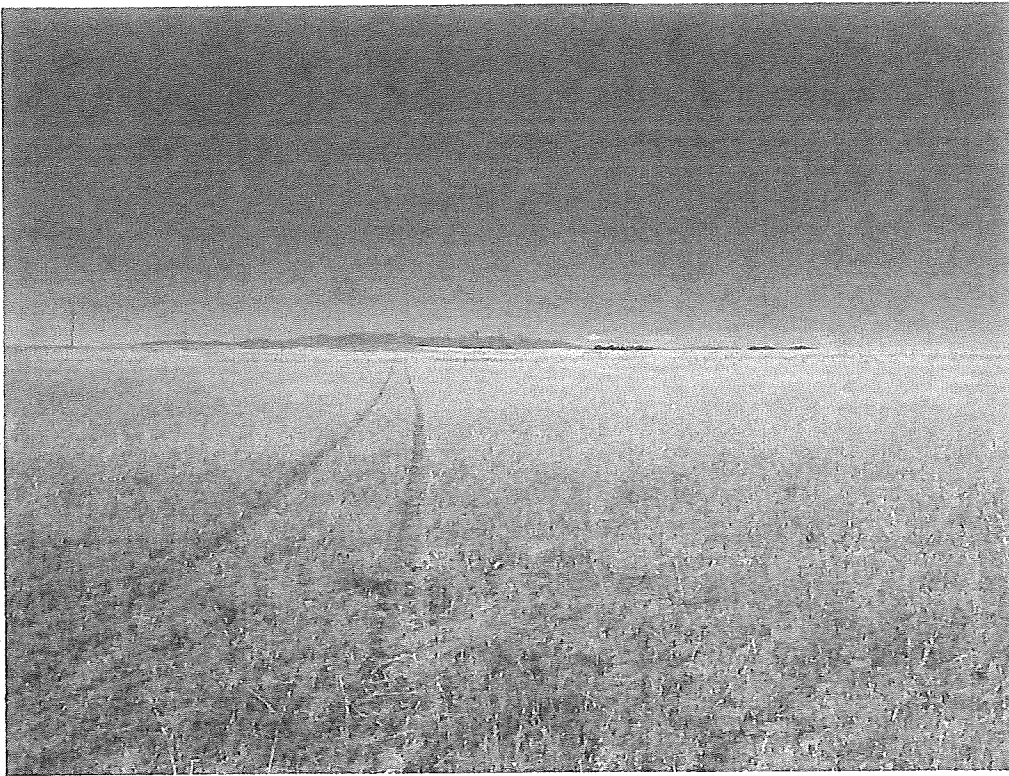
**Looking southwest
from the northeastern
portion of the site.**

October 13, 2021



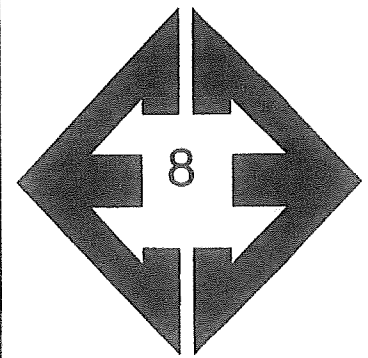
**Looking northwest
from the southeastern
portion of the site.**

October 13, 2021



**Looking west from the
southeastern portion
of the site.**

October 13, 2021



**Looking east from the
southwestern portion
of the site.**

October 13, 2021

APPENDIX B: Test Pit Logs

TEST PIT NO. 1
 DATE EXCAVATED 10/14/2021
 Job # 212655

TEST PIT NO. 2
 DATE EXCAVATED 10/14/2021
 CLIENT Rockwood Homes
 LOCATION 20040 US Highway 94 (Trinity)

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil, 0-4 inches	1						topsoil, 0-6 inches	1					
	2							2					
	3							3					
sandy clay loam, fine to coarse grained, brown, moist	4			bl	s	3	sandy loam, fine to coarse coarse grained, brown, moist	4			bl	m	2
	5							5					
	6						sandy loam, fine to coarse grained, brown, moist	6			gr	m	2
sandy loam, fine to coarse grained, brown, moist	7			gr	m	2		7					
	8							8					
	9							9					
	10							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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 COLORADO SPRINGS, COLORADO 80907

TEST PIT LOG

DRAWN:

DATE:

CHECKED: *LL*

DATE: *10/29/21*

JOB NO.:
 212655

FIG NO.:
B-1

TEST PIT NO. 3
 DATE EXCAVATED 10/14/2021
 Job # 212655

TEST PIT NO. 4
 DATE EXCAVATED 10/14/2021
 CLIENT Rockwood Homes
 LOCATION 20040 US Highway 94 (Trinity)

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil, 0-4 inches	1						topsoil, 0-6 inches	1					
	2							2					
	3							3					
sandy clay loam, fine to coarse grained, brown, moist	4			bl	m	3	sandy clay loam, fine to coarse grained, brown, moist	4			bl	m	3
	5							5					
sandy loam, fine to coarse grained, brown, moist	6			gr	m	2	sandy clay loam, fine to coarse grained, brown, moist	6			gr	m	3
	7							7					
	8							8					
	9							9					
	10							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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505 ELKTON DRIVE
 COLORADO SPRINGS, COLORADO 80907

TEST PIT LOG

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DATE:

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10/29/21

JOB NO.:
 212655

FIG NO.:

B-2

TEST PIT NO. 5
 DATE EXCAVATED 10/14/2021
 Job # 212655

TEST PIT NO. 6
 DATE EXCAVATED 10/14/2021
 CLIENT Rockwood Homes
 LOCATION 20040 US Highway 94 (Trinity)

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil, 0-3 inches	1						topsoil, 0-6 inches	1					
	2							2					
	3							3					
sandy clay loam, fine to coarse grained, brown, moist	4			bl	m	3	sandy clay loam, fine to coarse grained, brown, moist	4			ma		3A
	5							5					
	6							6					
sandy loam, fine to coarse grained, brown, moist	7			gr	m	2	sandy clay loam, fine to coarse grained, brown, moist	7			gr	m	3
	8							8					
	9							9					
	10							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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JOB NO.:
 212655

FIG NO.:
B-3

TEST PIT NO. 7
 DATE EXCAVATED 10/14/2021
 Job # 212655

TEST PIT NO. 8
 DATE EXCAVATED 10/14/2021
 CLIENT Rockwood Homes
 LOCATION 20040 US Highway 94 (Trinity)

REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil, 0-3 inches	1						topsoil, 0-5 inches	1					
	2							2					
sandy clay loam, fine to coarse grained, brown, moist	3			gr	m	3	sandy clay loam, fine to coarse grained, brown, moist	3			gr	m	3
	4							4					
	5							5					
sandy loam, fine to coarse grained, brown, moist	6			gr	s	2		6					
	7						sandy loam, fine to coarse grained, brown, moist	7			gr	s	2
	8							8					
	9							9					
	10							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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DATE:

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JOB NO.:
 212655

FIG NO.:

B-4

TEST PIT NO. 9
DATE EXCAVATED 10/14/2021
Job # 212655

TEST PIT NO. 10
DATE EXCAVATED 10/14/2021
CLIENT Rockwood Homes
LOCATION 20040 US Highway 94 (Trinity)

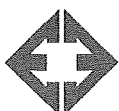
REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Soil Structure Shape	Soil Structure Grade	USDA Soil Type
topsoil, 0-3 inches	1						topsoil, 0-6 inches	1					
sandy clay loam, fine to coarse grained, brown, moist	2			bl	m	3		2					
	3							3					
	4						sandy clay, fine to medium grained, dark brown, moist	4			ma		4A
	5							5					
sandy loam, fine to coarse grained, brown, moist	6							6					
	7			gr	s	2	sandy clay, fine to medium grained, brown, moist	7			ma		4A
	8							8					
	9							9					
	10							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

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DATE:

JOB NO.:
212655

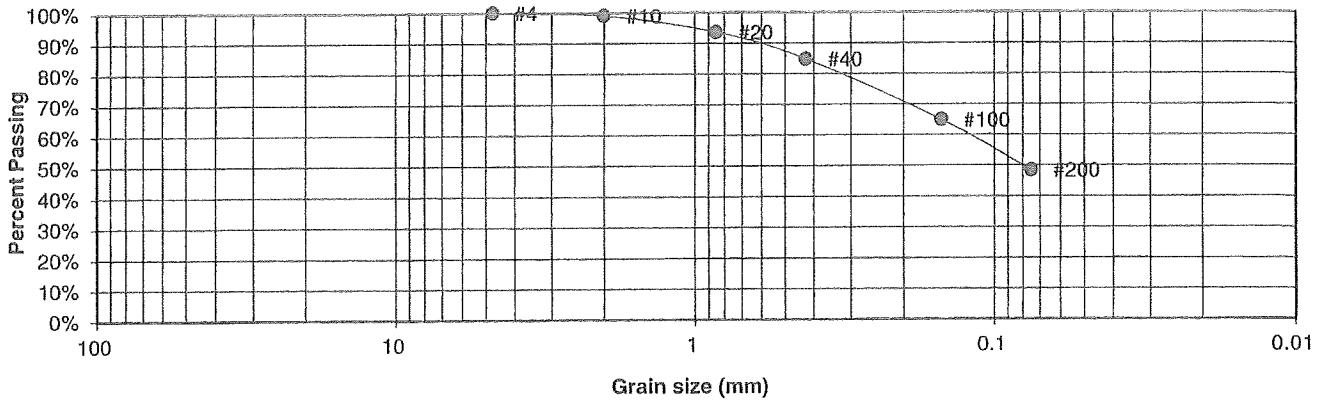
FIG NO.:
B-5

APPENDIX C: Laboratory Test Results

UNIFIED CLASSIFICATION SM
 SOIL TYPE # 1
 TEST BORING # TP-1
 DEPTH (FT) 3.5

CLIENT ROCKWOOD HOMES
 PROJECT 20040 HIGHWAY 94
 JOB NO. 212655
 TEST BY BL

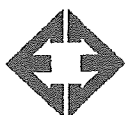
Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.0%
20	93.6%
40	84.8%
100	64.9%
200	48.4%

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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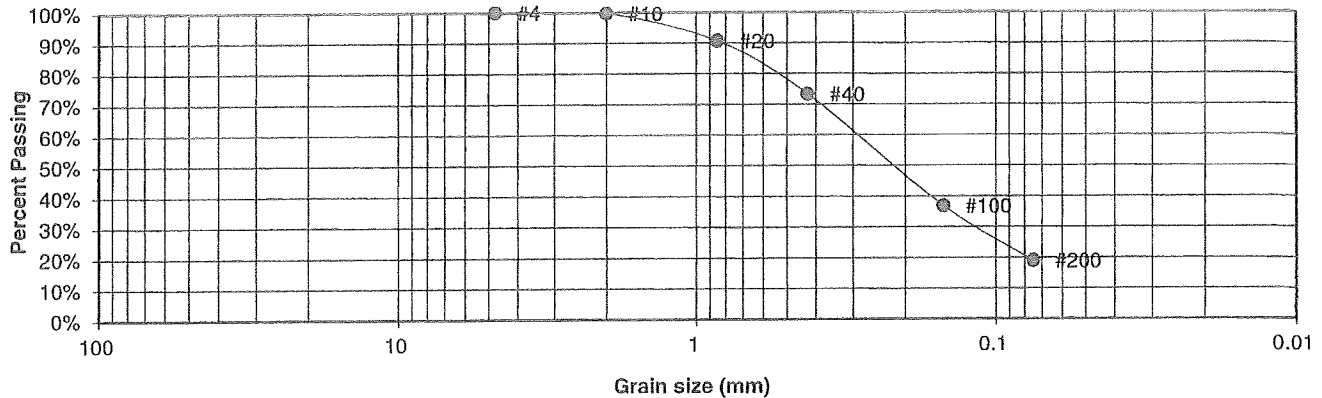
FIG NO.:

C-1

UNIFIED CLASSIFICATION SM
 SOIL TYPE # 1
 TEST BORING # TP-3
 DEPTH (FT) 3

CLIENT ROCKWOOD HOMES
 PROJECT 20040 HIGHWAY 94
 JOB NO. 212655
 TEST BY BL

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.7%
20	90.7%
40	73.2%
100	36.8%
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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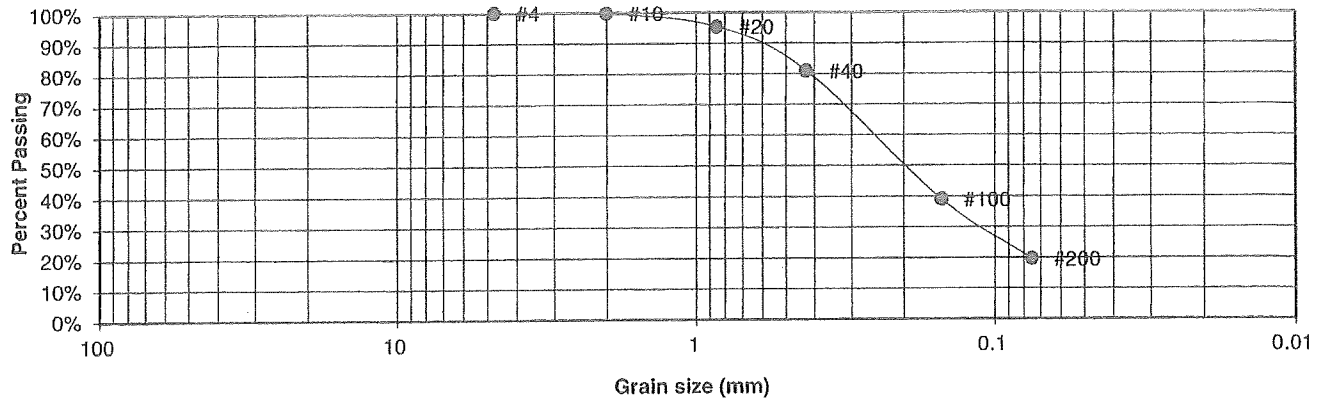
JOB NO.:
212655

FIG NO.:
C-2

UNIFIED CLASSIFICATION SM
 SOIL TYPE # 1
 TEST BORING # TP-5
 DEPTH (FT) 6.5

CLIENT ROCKWOOD HOMES
 PROJECT 20040 HIGHWAY 94
 JOB NO. 212655
 TEST BY BL

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.8%
20	95.4%
40	80.9%
100	38.9%
200	19.5%

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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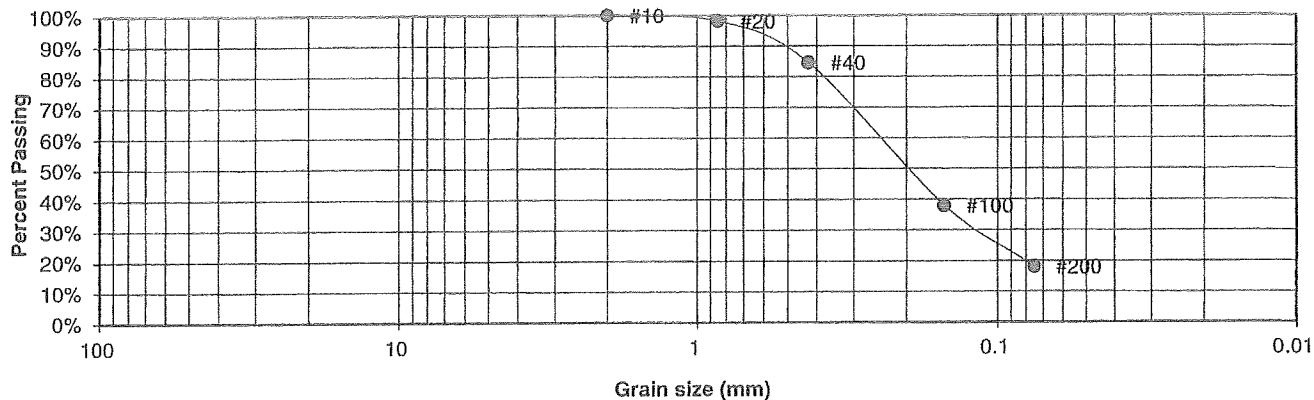
JOB NO.:
212655

FIG NO.:

C-3

<u>UNIFIED CLASSIFICATION</u>	SM	<u>CLIENT</u>	ROCKWOOD HOMES
<u>SOIL TYPE #</u>	1	<u>PROJECT</u>	20040 HIGHWAY 94
<u>TEST BORING #</u>	TP-7	<u>JOB NO.</u>	212655
<u>DEPTH (FT)</u>	2.5	<u>TEST BY</u>	BL

**Sieve Analysis
Grain Size Distribution**



<u>U.S. Sieve #</u>	<u>Percent Finer</u>
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	98.2%
40	84.5%
100	38.0%
200	18.0%

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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**LABORATORY TEST
RESULTS**

DRAWN:

DATE:

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DATE:

LL

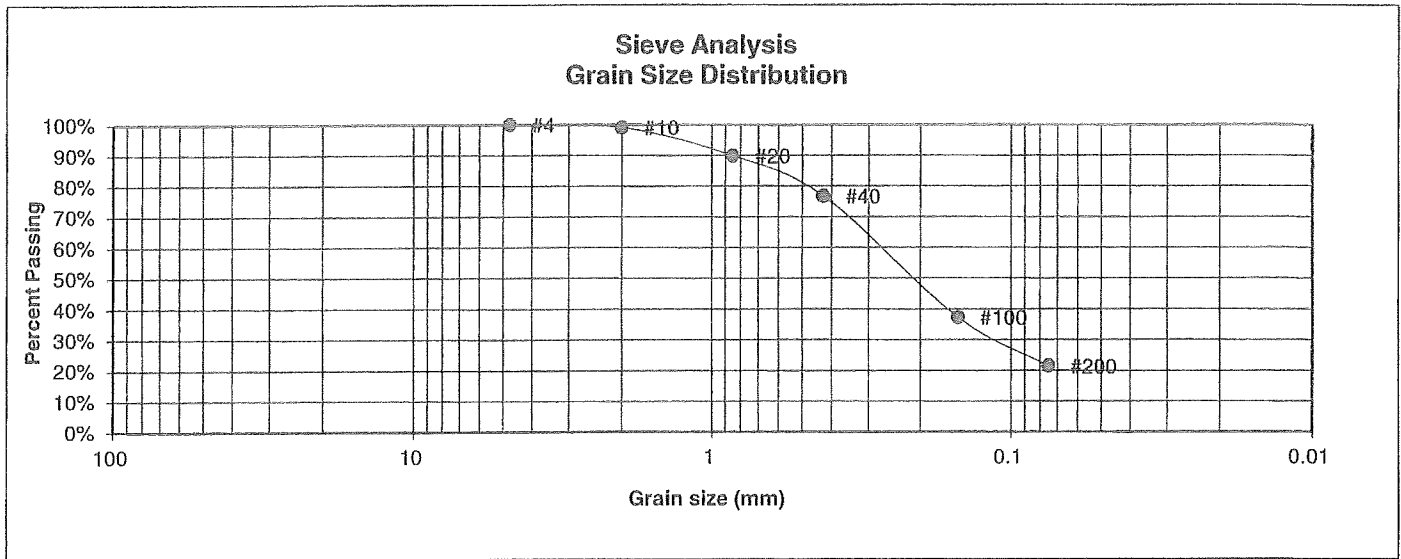
10/29/21

JOB NO.:
212655

FIG NO.:

C-4

UNIFIED CLASSIFICATION	SM	CLIENT	ROCKWOOD HOMES
SOIL TYPE #	1	PROJECT	20040 HIGHWAY 94
TEST BORING #	TP-9	JOB NO.	212655
DEPTH (FT)	6.5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	99.1%
20	89.8%
40	76.7%
100	37.2%
200	21.4%

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

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DATE:

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L.L.L.

DATE:
10/29/21

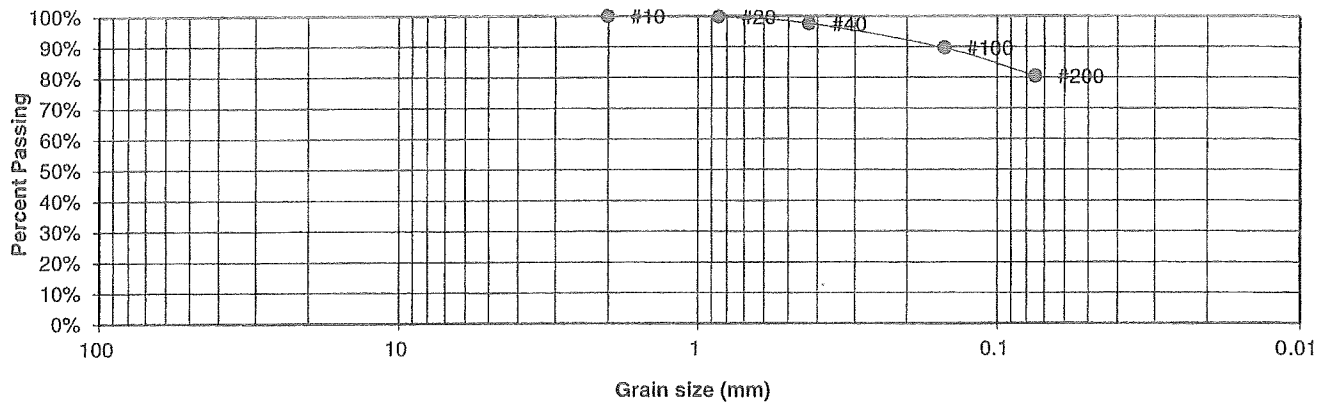
JOB NO.:
212655

FIG NO.:
C-5

UNIFIED CLASSIFICATION ML
 SOIL TYPE # 2
 TEST BORING # TP-10
 DEPTH (FT) 3.5

CLIENT ROCKWOOD HOMES
 PROJECT 20040 HIGHWAY 94
 JOB NO. 212655
 TEST BY BL

Sieve Analysis Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	100.0%
20	99.8%
40	97.5%
100	89.6%
200	80.4%

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:

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DATE:
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JOB NO.:
 212655

FIG NO.:
C-6

APPENDIX D: Soil Survey 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, tal^l
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
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 content: 5 percent
Available water supply, 0 to 60 inches: Low (about 4.5 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R049XB210CO - Sandy Foothill
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 19, Aug 31, 2021

El Paso County Area, Colorado

95—Truckton loamy sand, 1 to 9 percent slopes

Map Unit Setting

National map unit symbol: 2yvrn

Elevation: 5,800 to 7,100 feet

Mean annual precipitation: 12 to 19 inches

Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 90 to 155 days

Farmland classification: Not prime farmland

Map Unit Composition

Truckton and similar soils: 87 percent

Minor components: 13 percent

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

Description of Truckton

Setting

Landform: Fan remnants, interfluves

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Wind re-worked alluvium derived from arkose

Typical profile

A - 0 to 4 inches: loamy sand

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: 1 to 9 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): 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 content: 1 percent

Maximum salinity: Nonsaline to very slightly saline (0.1 to 2.0
mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 6.5
inches)

Interpretive groups

Land capability classification (irrigated): 6e

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: A

Ecological site: R049XB210CO - Sandy Foothill

Hydric soil rating: No

Minor Components

Blakeland

Percent of map unit: 5 percent

Landform: Hills, interfluves

Landform position (two-dimensional): Shoulder, backslope, summit

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Convex, linear

Across-slope shape: Convex, linear

Ecological site: R049XB210CO - Sandy Foothill

Hydric soil rating: No

Bresser

Percent of map unit: 5 percent

Landform: Terraces, interfluves

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: R049XB210CO - Sandy Foothill

Hydric soil rating: No

Urban land

Percent of map unit: 2 percent

Hydric soil rating: No

Ellicott, occasionally flooded

Percent of map unit: 1 percent

Landform: Drainageways, flood plains

Down-slope shape: Linear

Across-slope shape: Concave, linear

Ecological site: R067BY031CO - Sandy Bottomland

Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado

Survey Area Data: Version 19, Aug 31, 2021

El Paso County Area, Colorado

96—Truckton sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2yvrd

Elevation: 5,400 to 7,000 feet

Mean annual precipitation: 14 to 23 inches

Mean annual air temperature: 45 to 52 degrees F

Frost-free period: 90 to 155 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: 85 percent

Minor components: 15 percent

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

Description of Truckton

Setting

Landform: Interfluves, fan remnants

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Wind 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: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Very 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 content: 1 percent

Maximum salinity: Nonsaline to very slightly saline (0.1 to 2.0
mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 6.6
inches)

Interpretive groups

Land capability classification (irrigated): 3e

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: A
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Minor Components

Blakeland

Percent of map unit: 5 percent
Landform: Interfluves, hills
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Bresser

Percent of map unit: 5 percent
Landform: Interfluves, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Pleasant, frequently ponded

Percent of map unit: 2 percent
Landform: Closed depressions
Down-slope shape: Concave, linear
Across-slope shape: Concave
Ecological site: R067BY010CO - Closed Upland Depression
Hydric soil rating: Yes

Urban land

Percent of map unit: 2 percent
Hydric soil rating: No

Ellicott, occasionally flooded

Percent of map unit: 1 percent
Landform: Flood plains, drainageways
Down-slope shape: Linear
Across-slope shape: Concave, linear
Ecological site: R067BY031CO - Sandy Bottomland
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021

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
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 content: 1 percent
Maximum salinity: Nonsaline (0.1 to 1.9 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 6.6 inches)

Interpretive groups

Land capability classification (irrigated): 6e
Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: A
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Minor Components

Blakeland

Percent of map unit: 8 percent
Landform: Interfluves, hillslopes
Landform position (two-dimensional): Summit, shoulder, backslope
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Bresser

Percent of map unit: 7 percent
Landform: Interfluves, low hills
Landform position (two-dimensional): Foothill, toeslope
Landform position (three-dimensional): Base slope
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Ecological site: R049XB210CO - Sandy Foothill
Hydric soil rating: No

Data Source Information

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 19, Aug 31, 2021