

Job No. 197925

November 1, 2024

Challenger Communities
8605 Explorer Drive, Suite 250
Colorado Springs, CO 80920

Re: Addendum to Soils and Geology Study
Falcon Highlands South, Filing No. 1, Phase 1
El Paso County, Colorado

Dear Challenger Communities:

RMG – Rocky Mountain Group (RMG) prepared the original *Soils and Geology Study, Phases 1-4, Falcon Highlands* (RMG Job No. 184041, last dated September 7, 2022) for the proposed development comprising 380 single-family residential lots on approximately 109.05 acres located east of the intersection of Highway 24 and Meridian Road in El Paso County, Colorado. That report was reviewed by personnel of the El Paso County Planning and Community Development and the Colorado Geological Survey (CGS). The location of the site is presented in the Site Vicinity Map, Figure 1.

Since the approval of that report, which contained all four phases, it has been requested an updated report be completed for Filing No. 1. The filings are now defined and this letter is to update and confirm that our findings and recommendations previously presented are still valid and/or to provide additional information since the issuance of the original *Soils and Geology Study*. The Filing No. 1, Phase I, Lot Layout is presented in Figure 2.

Existing Land Use

The site currently consists of a portion of one parcel. The parcel included in this amended study is:

- Schedule No. 5300000817 – consists of approximately 109.05 acres and encompasses the entire site. The parcel is not developed.

Filing No. 1, Phase I was originally Phase 4 of the previous report. The lot and roadway layouts have remained the same.

Project Description

Filing No. 1, Phase I is to consist of approximately 23.592 acres. Of that, single-family residences are to comprise approximately 12.8 acres (55%), open spaces and parks are to comprise approximately 6.1 acres (25%), and the remaining 4.7 acres (20%) are designated for public right-of-way usage. The main access into the filing, Sahalee Trail (shown as Street A on Figure 2) is to extend east and south from the existing Bridal Vail Way. One interior roadway, Fox Kestrel Court

(shown as Streets B and C on Figure 2), is to extend northeast and southwest from Sahalee Trail and terminate on each end with a cul-de-sac. Both the roadways are to be constructed with a 50-foot ROW that will meet the requirements of an El Paso County Local Residential – Urban roadway. The roadways are to be paved and contain curb and gutter per El Paso County specifications.

Qualifications of Preparers

This *Addendum to Soils and Geology Study* was prepared by a professional geologist as defined by Colorado Revised Statutes section 34-1-201(3) and by a qualified geotechnical engineer as defined by policy statement 15, "Engineering in Designated Natural Hazards Areas" of the Colorado State Board of Registration for Professional Engineers and Professional Land Surveyors. (Ord. 96-74; Ord. 01-42)

The principle investigators for this study are Kelli Zigler P.G., and Tony Munger, P.E. Ms. Zigler is a Professional Geologist as defined by State Statute (C.R.S 34-1-201) with over 24 years of experience in the geological and geotechnical engineering field. Ms. Kelli Zigler holds a B.S. in Geology from the University of Tulsa. Ms. Zigler has supervised and performed numerous geological and geotechnical field investigations throughout Colorado.

Tony Munger is a licensed professional engineer with over 24 years of experience in the construction engineering (residential) field. Mr. Munger and holds a B.S. in Architectural Engineering from the University of Wyoming.

Previous Studies and Investigations

Previous geotechnical engineering/geologic investigation for the site and nearby sites were available for our review and are listed below:

1. *Soils and Geology Study, Phases 1-4, Falcon Highlands, El Paso County, Colorado*, prepared by RMG – Rocky Mountain Group, Job No. 184041, last dated September 7, 2022.
2. *Engineering Geology Study, Falcon Highlands Subdivision, El Paso County, Colorado*, prepared by John Himmelrieck & Associates, Project No. 00-139, dated June 28, 2000.
3. *Soil and Geology Study, Falcon Highlands, Woodmen Road and Tamlin Road, El Paso County, Colorado*, prepared by Entech Engineering, Inc., Entech Job No. 39431, last dated January 24, 2002.
4. *Subsurface Soil Investigation, Lots 4, 30-44, 83-86, 101, 135-137, 142-146, 149-151, 1456, 157, 160, Falcon Highlands, Filing No. 2, El Paso County, Colorado*, prepared by RMG Engineers Group, Job No. 133001, dated August 24, 2012.

Since the issuance of our original report, the site conditions, topography and vegetation have not changed substantially.

RMG previously completed 11 exploratory test borings on June 8, 2021 for the original Soils and Geology Study. The borings extended to approximately 20 feet below the existing ground surface. Three of these previous test borings (TB-1, TB-2, and TB-3) were located within the area included

in this current study. RMG did not perform additional borings for this study. Since the site has not undergone significant changes since the issuance of the original report, additional test borings (beyond those already performed) would not be anticipated to provide new information that would substantially change the recommendations presented herein. The Explanation of Test Boring Logs, Test Boring Logs, Summary of Laboratory Results, and Soil Classification Data for the pertinent three borings are presented in Appendix A.

As noted in the review comments from the County and CGS, in regards to our original study, “groundwater measurements at the time of drilling, or even several weeks later, do not provide the necessary data to determine groundwater fluctuations.” At Challenger’s request, RMG installed 5 piezometers on May 15, 2024, within the Falcon Highlands Subdivision. The piezometer locations were selected by Challenger, within tracts around the subdivision. Groundwater depths are being measured within these piezometers on a montly basis, for a period of at least 12 months.

Though we did not perform new test borings for this study, we are utilizing our current piezometer readings to provide additional groundwater information. The groundwater depths measured in each of the piezometers to date are presented in the **Groundwater** section of this report. The groundwater monitoring is ongoing, and future measurements can be made available (upon request) once completed.

Geologic Conditions

Based upon review of the *Falcon Quadrangle Geologic Map, El Paso County, Colorado*, the site is within an area of the Colorado Piedmont, a region that is distinguished primarily by the fact that it has been stripped of the Miocene fluvial rocks that cap the adjoining High Plains Section of the Great Plains physiographic province. Sand is abundant in the Falcon Highlands area due to the sandstone bedrock of the Squirrel Formation and/or Dawson Formation. Sandy alluvial and pluvial deposits blanket the majority of the area, and are generally 5 feet thick or more. The deposits are considered residuum, unconsolidated material derived from the weathering of the underlying bedrock, and are wide-spread. The sandstone is generally weakly-cemented, easily excavated, shows little or no lamination, and can be irregularly stratified with evidence of cross sorting.

General Geology

Our field investigation included a site reconnaissance, with consideration given to geologic features and significant surficial deposits. The general geology of the area is typically a combination of alluvial and pluvial deposits overlying the Black Squirrel Formation. The general geology units were mapped in our previous *Soils and Geology Study*, and the units that occur within the currently-proposed Filing No. 1, Phase I, are noted below:

- *Qa2: Alluvium two* (lower Holocene) – Dark gray to brown, poorly to well sorted, moderately consolidated, silt, sand, gravel, and minor clay and occasional boulders in stream terrace deposits approximately 6 to 12 feet above the modern flood plain or as non-terrace forming alluvium in valley headwaters. Clasts are subrounded to well-rounded and

the dominant sediment is sandy gravel with a silty sand matrix. Clay seams are poorly to moderately stratified.

- *Tbs: Black Squirrel Formation (Paleocene)* – Gray-green to tan to brownish gray, moderately-well sorted cross-bedded sandy arkoses interbedded with micaceous sand claystone that contain abundant plant fragments and occasional, fine-to medium-grained massive arkosic beds. The exposed upper part of the Black Squirrel Formation is gradational with the overlying Dawson Arkose making the contact problematic. Thickness within the Falcon quadrangle is approximately 130 feet. The claystone within this unit may be prone to swelling when wet.
- *Af: – Artificial Fill* – man-placed fill in the form of stockpiles that were placed between prior to 2005 to 2015, as indicated by historical aerial photos. The stockpiles generally consisted of unsorted silt, sand, clay, and rock fragments. The unsorted soil was mixed with uncontrolled dumping of household debris. The average thickness of the unit is less than 15 feet, above and below the ground surface.

Engineering Geology

The Engineering Geology is presented below. Charles Robinson and Associates have mapped one environmental engineering unit on the site as:

- 2D: Eolian deposits generally on flat to gentle slopes of upland areas.

The Engineering and Geology Map specific to Filing No. 1, Phase I is included in Figure 3.

Potential Geologic Conditions

The following geologic constraints were considered in the preparation of the previous report and this addendum, and are not expected to pose a significant risk to the proposed development in Filing No. 1, Phase I:

- Avalanches
- Debris Flows, Debris Fans, Mudslides
- Floodplains
- Ground Subsidence
- Landslides
- Rockfall
- Steeply Dipping Bedrock
- Unstable or Potentially Unstable Slopes
- Scour, Erosion, Accelerated Erosion along creek banks and drainageways

The geologic conditions that are anticipated to impact Filing No. 1, Phase I are as follows:

Groundwater

Groundwater checks were performed at the time of the original drilling in June, 2021, with additional groundwater checks in September and October of 2021. The subsequent checks revealed that all eleven test borings had water at depths ranging from 9 to 17.4 feet. The groundwater depths of three test borings located in Filing No. 1, Phase I (TB-1, TB-2, and TB-3) were as follows:

Test Boring (TB) Number	Depth of Groundwater (ft) June 2021	Depth of Groundwater (ft) September 2021	Depth of Groundwater (ft) October 2021
TB-1	19	3.5	16
TB-2	15	3.5	14.6
TB-3	10	3.5	11.4

We do understand groundwater information obtained at the time of the preliminary investigations performed prior to the land development phase may or may not be representative of the conditions present at the time of construction. Furthermore, the development processes (reshaping of the ground surface, installation of buried utilities, installation of an underdrain below the roadways, etc.) can significantly alter the depth and flow paths of the subsurface water. The construction of surrounding lots can also alter the amount and depth of subsurface groundwater below a given lot.

Our recommendations, as noted in our original study, were that basement construction should be restricted except where one of the following conditions apply:

- Underdrains are installed at the bottom of sanitary sewer trenches within drive lanes;
- A year-long groundwater monitoring study has been undertaken, and the results indicate that groundwater is sufficiently deep to allow basement construction;
- The proposed site grading will result in at least 14 feet of separation between the proposed ground surface and the groundwater elevation.

Based on the Grading Plan provided by Challenger Homes, prepared by Atwell and dated July 12, 2024, the majority of the grading is to either level the site and maintain or raise the existing grades. Minor cuts are proposed in localized areas, but they appear to be limited to approximately 3 feet or less.

Mitigation

As noted above, it is our understanding that stiffened-slab foundations are to be used for the proposed lots. Neither basement nor crawlspace construction are currently proposed.

Additionally, at Challenger's request, RMG installed 5 piezometers on May 15, 2024, within the Falcon Highlands Subdivision. The piezometer locations were selected by Challenger, within tracts around the subdivision. The location of the piezometers is shown in Figure 4. Piezometer 1 (P1) is located in a tract within Filing No. 1, Phase I. However, for completeness, all 5 piezometer readings to date are presented in the table below.

Piezometer Number	Date of reading (2024)	Total Depth (ft) of Piezometer	Depth (ft) to Groundwater
P1			
	May 15	20	6.5
	June 17	20	3.8
	July 15	20	4.0
	August 21	20	5.0
	September 24	20	5.5
	October 22	20	7.3
P2			
	May 15	20	14.0
	June 17	20	13.8
	July 15	20	13.8
	August 21	20	13.5
	September 24	20	14.5
	October 22	20	11.9
P3			
	May 15	19.4	8.5
	June 17	19.4	4.5
	July 15	19.4	4.5
	August 21	19.4	5.0
	September 24	19.4	7.5
	October 22	19.4	8.0
P4			
	May 15	24	*N/A
	June 17	24	7.0
	July 15	24	7.0
	August 21	24	5.0
	September 24	24	8.5
	October 22	24	9.0
P5			
	May 15	24.2	*N/A
	June 17	24.2	15.5
	July 15	24.2	15.0
	August 21	24.2	14.5
	September 24	24.2	15.0
	October 22	24.2	15.0

**N/A is not believed that groundwater was not present but some other technical issues may have been encountered.*

Based on these monthly groundwater measurements, it is our opinion that the proposed stiffened slab foundations are suitable for the included lots. However, underslab drains may be recommended at the time of either the lot-specific subsurface soil investigations and/or open excavation observations.

Furthermore, overlot grading may encounter elevated groundwater conditions necessitating localized stabilization, especially in areas where groundwater measurements were at depths of 7 feet or less from the proposed finished ground surface.

Compressible and/or Potentially Expansive Soils

The subsurface materials at the site generally consist of silty to clayey sand and sandy clay overlying sandstone and claystone. Based on the test borings performed for the original *Soils and Geology Study* referenced above, the soils and bedrock encountered at the site generally possess low to moderate swell potential and low compressibility potential. If these materials are encountered in the excavations for the proposed residences, they can readily be mitigated with typical construction practices common to this region of El Paso County, Colorado.

Mitigation

Shallow foundations are anticipated for the lots included in this study. Foundation design and construction are typically adjusted for expansive or compressible soils. Several mitigation alternatives were presented in our previous study. Based on discussions with personnel of Challenger Communities, it is our understanding that stiffened slab foundations are preferred for these lots. Based on the boring logs and laboratory test data from our previous study, it is our opinion that stiffened slab foundations atop either undisturbed native soil or atop structural fill after limited overexcavation and replacement will be suitable for the proposed lots.

Undocumented Fill

Fill soils were encountered in five of the eleven test borings previously performed by RMG. The majority of fill was located in the southern half of the parcel and near the western boundary. Fill was not encountered in test borings TB-1, TB-2, or TB-3 which were located within the area of this study. However, some surficial fill may be encountered within this site.

Mitigation

The fill soils must be considered undocumented fill, and as such are not suitable for development. It is our opinion that they can be mitigated with typical construction practices common to the El Paso County region. If undocumented or otherwise unsuitable fill soils are encountered during the overlot grading process, they will require removal (overexcavation) and replacement with compacted structural fill. The zone of overexcavation shall extend to the bottom of the unsuitable fill zone and shall extend at least that same distance beyond the building perimeter (or to the lateral extent of the fill, if encountered first).

Additional Geologic Conditions

The following listed constraints were discussed and included in the original *Soils and Geology Study*, included in Appendix C. It is our opinion that our findings, conclusions, and recommendations regarding these conditions are still valid for the lots within the currently-proposed Filing No. 1, Phase 1:

- faults, seismicity, radon, flooding, surface drainage, erosion, corrosion, surface grading and drainage

Conclusions

Based upon our evaluation of the geologic conditions, it is our opinion that the proposed development is feasible. The potential for expansive/compressible soils and shallow groundwater are not considered unusual for the Front Range region of Colorado. Mitigation of geologic hazards is most effectively accomplished by avoidance. However, where avoidance is not a practical or acceptable alternative, geologic hazards should be mitigated by implementing appropriate planning, engineering, and local construction practices.

Stiffened slab foundations are currently proposed with in Filing No. 1, Phase. The foundation and floor slabs of the structure should be designed using the recommendations provided in the site-specific subsurface soil investigation performed for each lot. In addition, appropriate surface drainage should be established during construction and maintained by the homeowner.

The findings, conclusions and recommendations presented in this report were provided to evaluate the suitability of the site for future development. Unless indicated otherwise, the test borings, laboratory test results, conclusions and recommendations presented in this report are not intended for use for design and construction. ***A site-specific subsurface soil investigation will be required for all proposed residences.***

To develop recommendations for construction of the proposed roadways, a pavement design investigation should be performed. This investigation should consist of additional test borings, soil laboratory testing and specific recommendations for the design and construction of roadway pavement sections.

The recommendations in this and the referenced reports are intended to address normal surface drainage conditions, assuming the presence of groundcover (established vegetation, paved surfaces, and/or structures) throughout the regions upslope from this structure. However, groundcover may not be present due to a variety of factors (ongoing construction/development, wildfires, etc.). During periods when groundcover is not present in the "upslope" regions, higher than normal surface drainage conditions may occur, resulting in perched water tables, excess runoff, flash floods, etc. In these cases, the surface drainage recommendations presented herein (even if properly maintained) may not mitigate all groundwater problems or moisture intrusion into the structure.

Revisions and modifications to the conclusions and recommendations presented in this report may be issued subsequently by RMG based upon additional observations made during grading and construction which may indicate conditions that require re-evaluation of some of the criteria presented in this report.

Closing

This report is for the exclusive purpose of providing geologic hazards information and preliminary geotechnical engineering recommendations. The scope of services did not include, either specifically or by implication, evaluation of wild fire hazards, environmental assessment of the

site, or identification of contaminated or hazardous materials or conditions. Development of recommendations for the mitigation of environmentally related conditions, including but not limited to, biological or toxicological issues, are beyond the scope of this report. If the owner is concerned about the potential for such contamination or conditions, other studies should be undertaken.

This report has been prepared for **Challenger Communities** in accordance with generally accepted geotechnical engineering and engineering geology practices. The conclusions and recommendations in this report are based in part upon data obtained from review of available topographic and geologic maps, review of available reports of previous studies conducted in the site vicinity, a site reconnaissance, and research of available published information, soil test borings, soil laboratory testing, and engineering analyses. The nature and extent of variations may not become evident until construction activities begin. If variations then become evident, RMG should be retained to re-evaluate the recommendations of this report, if necessary.

Our professional services were performed using that degree of care and skill ordinarily exercised, under similar circumstances, by geotechnical engineers and engineering geologists practicing in this or similar localities. RMG does not warrant the work of regulatory agencies or other third parties supplying information which may have been used during the preparation of this report. No warranty, express or implied, is made by the preparation of this report. Third parties reviewing this report should draw their own conclusions regarding site conditions and specific construction techniques to be used on this project.

I hope this provides the information you have requested. Should you have questions, please feel free to contact our office.

Cordially,

Reviewed by,

RMG – Rocky Mountain Group

RMG – Rocky Mountain Group



Kelli Zigler
Project Geologist

Tony Munger, P.E.
Sr. Geotechnical Project Manager



Additional Referenced Documents

1. *Falcon Highlands South, Filing No. 1, Phase 1, Construction Plans*, prepared by Atwell, Job No. 24004308, dated July 12, 2024.
2. *Falcon Highlands South, Filing No. 1, Landscape Construction Documents*, prepared by Matrix, Project No. 24.1208.013, date issued, August 16, 2024.
3. *Falcon Highland, Concept Plan 03, Phasing Exhibit*, prepared by Matrix, dated May 18, 2021.
4. *Appendix C, Soils Investigation Reports and Mitigation, Engineering Criteria Manual*, El Paso County, revised July 9, 2019.
5. *Master Plan for Mineral Extraction, Map 2*. El Paso County, February 8, 1996,
6. *Earthquake Potential in Colorado, A Preliminary Evaluation*, Colorado Geological Survey, Bulletin 4, Kirkham, R.M. and Rogers, W.P., 1981,
7. *Results of the 1987-88 EPA Supported Radon Study in Colorado, with a discussion on Geology*, Open file Report 91-4, Colorado Geological Survey, 1991,
8. *Colorado Springs Landslide Susceptibility, Colorado Geological Survey*: <https://cologeosurvey.maps.arcgis.com/apps/webappviewer/index.html?id=5e7484a637c4432e84f4f16d0af306d3>
9. *Colorado Landslide Inventory, Colorado Geological Survey*: <https://cologeosurvey.maps.arcgis.com/apps/webappviewer/index.html?id=9dd73db7fbc34139abe51599396e2648>.
10. *Pikes Peak Regional Building Department*: <https://www.pprbd.org/>.
11. *City of Colorado Springs, Subdivision Document Viewer*: <http://www.springsgov.com/SubDivView/default.asp?cmdGoBack=New+Search...>
12. *El Paso County Assessor, El Paso County, Colorado*: <https://property.spatalest.com/co/elpaso/#/property/7109000098> and <https://property.spatalest.com/co/elpaso/#/property/7109000024>
13. *Colorado Geological Survey, USGS Geologic Map Viewer*: <http://coloradogeologicalsurvey.org/geologic-mapping/6347-2/>.
14. *Historical Aerials*: <https://www.historicaerials.com/viewer>, Images dated 1952, 1953, 1955, 1960, 1969, 1984, 1999, 2004, 2005, 2009, 2011, 2013, 2015, 2017, and 2019.
15. *USGS Historical Topographic Map Explorer*: <http://historicalmaps.arcgis.com/usgs/> Images dated 1950, 1951, 1956, 1657, 1963, 1966, 1970, 1974, 1977, 1994, 2001, 2013 and 2013.
16. *Google Earth Pro*, Imagery dated 1999, 2004, 2005, 2006, 2008, 2010, 2011, 2015, 2017, 2018, 2019, 2020, 2022, and 2024.



NOT TO SCALE



ROCKY MOUNTAIN GROUP

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 (303) 688-9475
Northern Office:
 Greeley / Evans, CO 80620
 (970) 330-1071

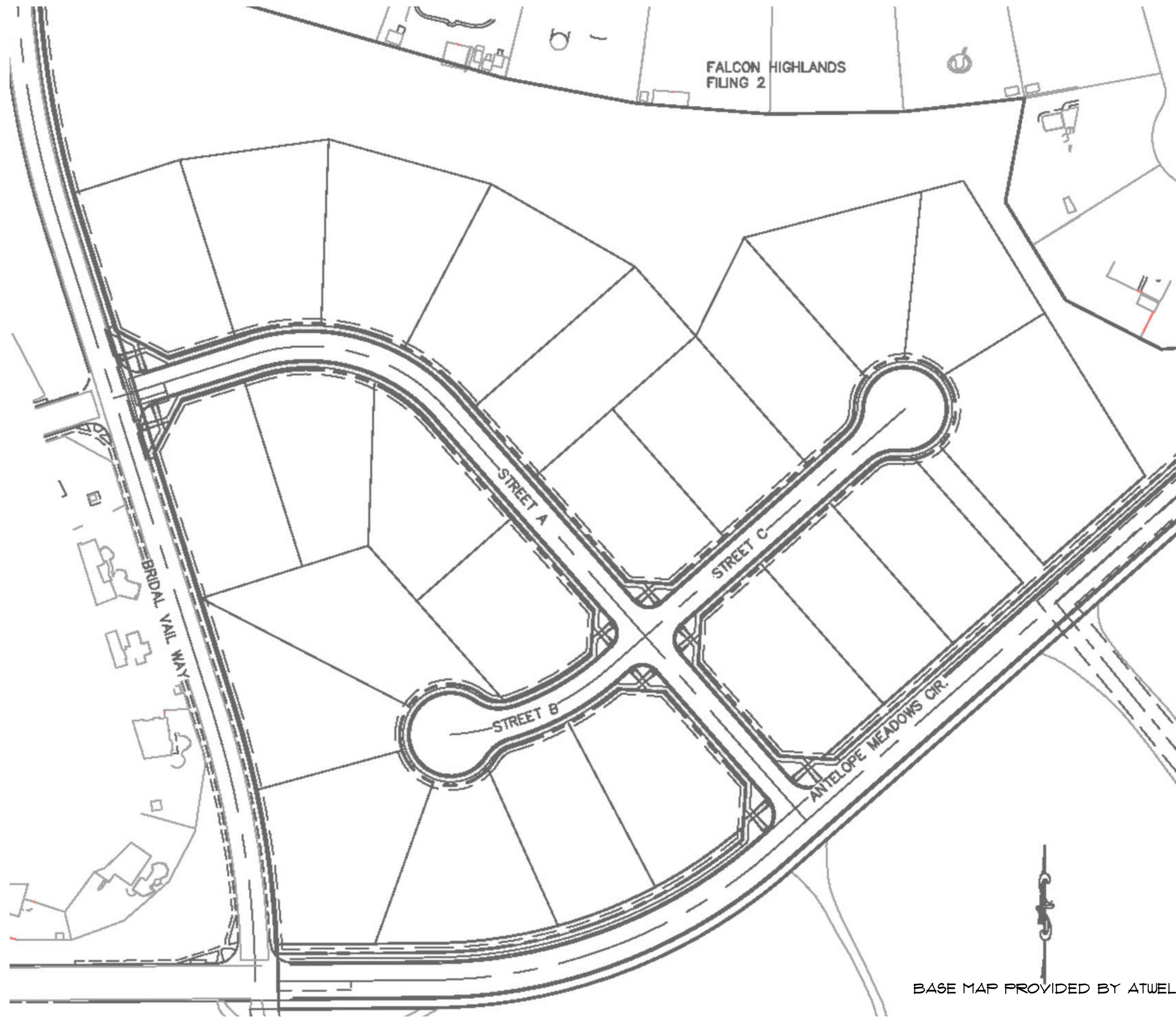
SITE VICINITY MAP

FALCON HIGHLANDS SOUTH
 FILING NO. 1 PHASE I
 EL PASO COUNTY, COLORADO
 CHALLENGER COLORADO, LLC

JOB No. 197925

FIG No. 1

DATE 10-31-2024



JOB No. 184041



ROCKY MOUNTAIN GROUP

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 80918

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Northern Office:
 Greeley / Evans, CO 80620
 (970) 330-1071

Woodland Park Office:
 (719) 687-6077

Monument Office:
 (719) 488-2145

Pueblo / Canon City:
 (719) 544-7750

FALCON HIGHLANDS SOUTH
 FILING NO. 1, PHASE 1
 EL PASO COUNTY, COLORADO
 CHALLENGER COLORADO, LLC

ENGINEER: TM
 DRAIN BY: KZ
 CHECKED BY: TM
 ISSUED: 12/31/2024

LOT LAYOUT

SHEET No.
FIG-2



ROCKY MOUNTAIN GROUP

Southern Office
Colorado Springs, CO
80918

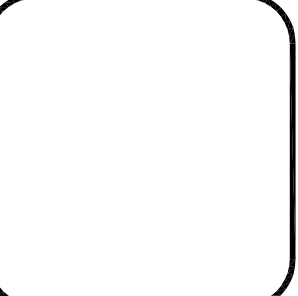
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Woodland Park Office:
(719) 687-6077

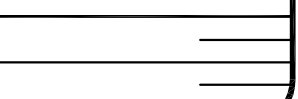
Monument Office:
(719) 488-2145

Pueblo / Canon City:
(719) 544-7750



FALCON HIGHLANDS SOUTH
FILING NO. 1, PHASE 1
EL PASO COUNTY, COLORADO
CHALLENGER COLORADO, LLC

ENGINEER:	TM
DRAWN BY:	KZ
CHECKED BY:	TM
ISSUED:	10/31/2024



ENGINEERING
AND GEOLOGY
MAP

SHEET No.

FIG-3

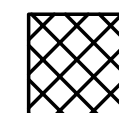


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⊕ DENOTES APPROXIMATE LOCATION OF TEST BORINGS AS PERFORMED FOR OUR ORIGINAL SOILS AND GEOLOGY STUDY, JOB NO. 184041, LAST DATED SEPTEMBER 7, 2022

- *Qa2*: Alluvium two (lower Holocene) - Dark gray to brown, poorly to well sorted, moderately consolidated, silt, sand, gravel, and minor clay and occasional boulders .
- *Tbs*: Black Squirrel Formation (Paleocene) - The exposed upped part of the Black Squirrel Formation is gradational with the overlying Dawson Arkose making the contact problematic. Thickness within the Falcon quadrangle is approximately 130 feet. The claystone within this unit may be prone to swelling when wet.

- *Af*: - Artificial Fill - man-placed fill in the form of stockpiles that were placed between prior to 2005 to 2015, as indicated by historical aerial photos. The stockpiles generally consisted of unsorted silt, sand, clay, and rock fragments. The unsorted soil was mixed with uncontrolled dumping of household debris. The average thickness of the unit is less than 15 feet, above and below the ground surface.
- 2D: - Eolian deposits generally on flat to gentle slopes of upland areas.



DENOTES AREA INCLUDED IN THIS STUDY

HIGHLANDS METROPOLITAN DISTRICT



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JOB No. 197925



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Monument Office:
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Pueblo / Canon City:
 (719) 544-7750

FALCON HIGHLANDS SOUTH
 FILING NO. 1, PHASE 1
 EL PASO COUNTY, COLORADO
 CHALLENGER COLORADO, LLC

ENGINEER:	TPM
DRAWN BY:	KZ
CHECKED BY:	TPM
ISSUED:	10-31-2024






PIEZOMETER
 LOCATIONS

SHEET No.
FIG-4

APPENDIX A







The Explanation of Test Boring Logs, Test Boring Logs, Summary of Laboratory Results, and Soil Classification Data from previous RMG Soil and Geology Study, Job No. Job No. 184041, last dated September 7, 2022.

SOILS DESCRIPTION

-  CLAYSTONE
-  SANDSTONE
-  SANDY CLAY
-  SILTY SAND
-  SILTY TO CLAYEY SAND

UNLESS NOTED OTHERWISE, ALL LABORATORY TESTS PRESENTED HEREIN WERE PERFORMED BY:
 RMG - ROCKY MOUNTAIN GROUP
 5085 LIST DRIVE, SUITE 200
 COLORADO SPRINGS, COLORADO

SYMBOLS AND NOTES

-  XX STANDARD PENETRATION TEST - MADE BY DRIVING A SPLIT-BARREL SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-1586. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).
-  XX UNDISTURBED CALIFORNIA SAMPLE - MADE BY DRIVING A RING-LINED SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-3550. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).
-  FREE WATER TABLE
-  DEPTH AT WHICH BORING CAVED
-  BULK DISTURBED BULK SAMPLE
-  AUG AUGER "CUTTINGS"
- 4.5 WATER CONTENT (%)

ROCKY MOUNTAIN GROUP

Structural Forensics



Geotechnical Materials Testing

Colorado Springs: (Corporate Office)
 5085 List Drive, Suite 200
 Colorado Springs, CO 80918
 (719) 548-0600

SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

EXPLANATION OF TEST BORING LOGS

JOB No. 184041

FIGURE No. 1

DATE Oct/25/2024

TEST BORING: 1 DATE DRILLED: 6/8/21 GROUNDWATER @ 16.0' 10/6/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	TEST BORING: 2 DATE DRILLED: 6/8/21 GROUNDWATER @ 14.6' 10/6/21	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
SAND, SILTY, with gravel, light brown to brown, medium dense to dense, moist	5			15	3.7	SAND, SILTY TO CLAYEY, with gravel, light brown, with rust staining, medium dense to dense, moist	5			30	7.0
SANDSTONE, SILTY TO CLAYEY, light brown to gray, with rust staining, hard, moist to wet	15			50/9"	16.3	SANDSTONE, SILTY TO CLAYEY, gray, very hard, moist to wet	15			10/0"	11.8
	20			50/9"	18.6	CLAYSTONE, SANDY, gray to dark gray, hard, moist to wet	20			50	21.7

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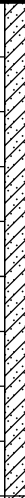

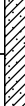

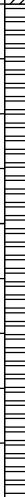



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TEST BORING LOG

JOB No. 184041

FIGURE No. 2

DATE Oct/25/2024

<p>TEST BORING: 3</p> <p>DATE DRILLED: 6/8/21 GROUNDWATER @ 11.4' 10/6/21</p>	DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %	
<p>SAND, SILTY TO CLAYEY, with gravel, light brown, with rust staining, medium dense, moist</p>	5			15	10.1	
<p>CLAY, SANDY, light gray, very stiff, moist to wet</p>	10			30	20.4	
<p>CLAYSTONE, SANDY, gray, medium hard, moist to wet</p>	15			50/11"	25.1	
	20			40	24.3	

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TEST BORING LOG

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FIGURE No. 3

DATE Oct/25/2024

Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/Collapse	USCS Classification
1	4.0	3.7								
1	9.0	7.0		NP	NP	0.2	11.1			SW-SM
1	14.0	16.3								
1	19.0	18.6								
2	4.0	7.0		NP	NP	4.8	18.4			SM
2	9.0	38.9								
2	14.0	11.8								
2	19.0	21.7								
3	4.0	10.1								
3	9.0	20.4		30	11	11.2	14.3			SC
3	14.0	25.1								
3	19.0	24.3								

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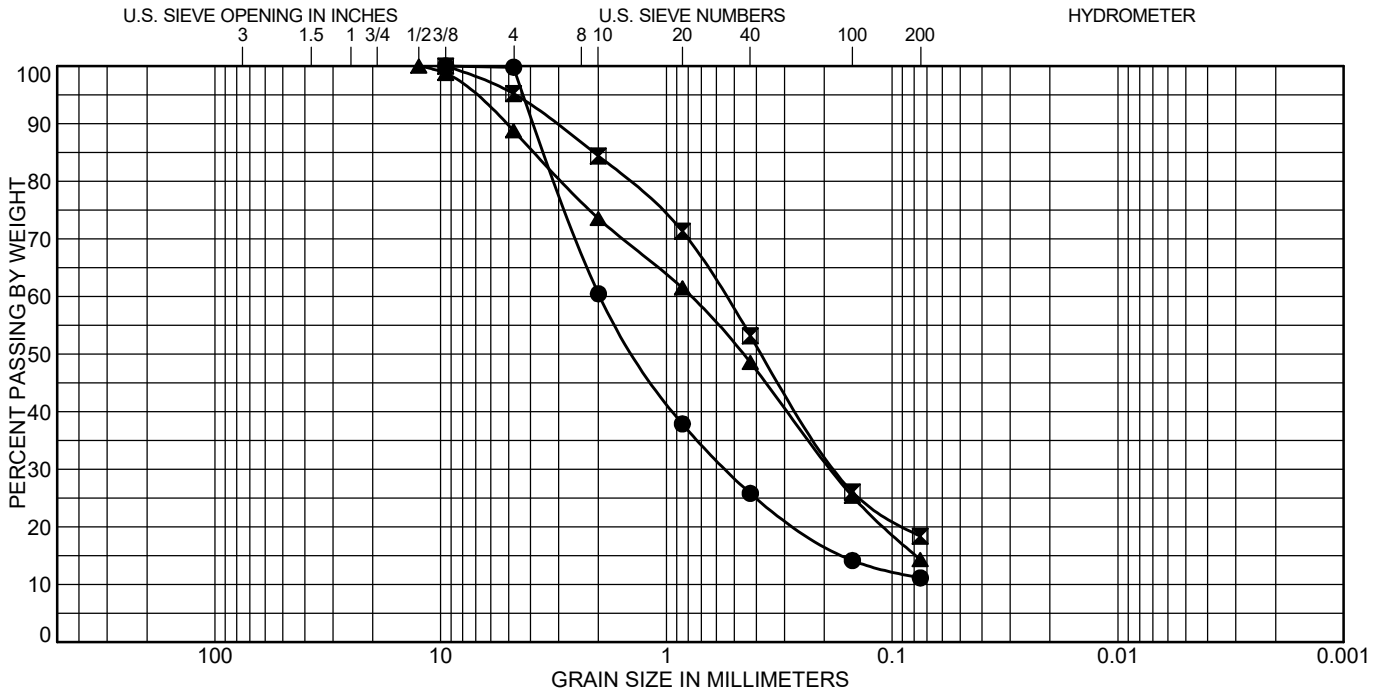
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SUMMARY OF LABORATORY TEST RESULTS

JOB No. 184041
 FIGURE No. 4
 PAGE 1 OF 1
 DATE Oct/25/2024



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Test Boring	Depth (ft)	Classification	LL	PL	PI
● 1	9.0	WELL-GRADED SAND with SILT(SW-SM)	NP	NP	NP
☒ 2	4.0	SILTY SAND(SM)	NP	NP	NP
▲ 3	9.0	CLAYEY SAND(SC)	30	19	11

Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
● 1	9.0	0.2	88.7	11.1	
☒ 2	4.0	4.8	76.8	18.4	
▲ 3	9.0	11.2	74.5	14.3	

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SOIL CLASSIFICATION DATA

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FIGURE No. 5

DATE Oct/25/2024