ENTECH
ENGINEERING, INC.

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SUBSURFACE SOIL INVESTIGATION
LUXURY AIRCRAFT HANGAR
8140 and 8150 CESSNA DRIVE
EL PASO COUNTY, COLORADO

Prepared for:

JP Nelson and Associates
1626 East Pikes Peak Avenue
Colorado Springs, Colorado 80909

Attn: John Nelson

May 21, 2021

Respectfully Submitted,

ENTECH ENGINEERING, INC.

Daniel P. Stegman

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35140
5-28-2021
PROFESSIONAL ENGINEER

Reviewed by:

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DPS/bs

Encl.

Entech Job No. 210695
AA projects/2021/210695 ssi

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SUBSURFACE SOIL INVESTIGATION
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1.0 INTRODUCTION

John P. Nelson and Associates is planning the construction of one aircraft hangar and associated site improvements at Meadowlake Airport, located southeast of Highway 24 and Judge Orr Road, in the eastern portion of El Paso County, Colorado. The approximate location of the site is shown on the Vicinity Map, Figure 1. The proposed development is shown on Figure 2, the Test Boring Location Map.

This report describes the subsurface investigation conducted for the planned building and provides recommendations for foundation design and construction. The subsurface soil investigation included drilling two (2) test borings within the footprint of the proposed building, collecting samples of soil, and conducting a geotechnical evaluation of the investigation findings. All drilling and subsurface investigation activities were performed by Entech Engineering, Inc. (Entech). The contents of this report, including the geotechnical evaluation and recommendations, are subject to the limitations and assumptions presented in Section 6.0.

2.0 PROJECT AND SITE DESCRIPTION

It is Entech Engineering, Inc. understanding that the project will consist of the construction of a 11,974 square foot pre-engineered aircraft hangar with slab-on-grade floors, and associated site improvements. Adjacent properties consist of existing aircraft hangars to the north, south east and west, and an aircraft runway to the west. The building area is generally flat. Vegetation on the site consisted of grass and weeds.

3.0 SUBSURFACE EXPLORATIONS AND LABORATORY TESTING

The subsurface conditions were investigated by drilling two exploratory test borings in the footprint of the proposed building. The borings were drilled to depths of 20 feet below the existing ground surface (bgs) using a truck-mounted continuous flight auger-drilling rig supplied and operated by Entech Engineering, Inc. Boring Logs descriptive of the subsurface conditions encountered during drilling and subsequent to drilling are presented in Appendix A. At the conclusion of drilling, observations of groundwater levels were made in each of the open borings. The approximate locations of the test borings are indicated on Figure 2.

Soil samples were obtained from the borings utilizing the Standard Penetration Test (ASTM D-1586) using a California Sampler. Results of the Standard Penetration Test (SPT) are included on the Test Boring Logs in terms of N-values expressed in blows per foot (bpf). Soil samples recovered from the borings were visually classified and recorded on the Test Boring Logs. The soil classifications were later verified utilizing laboratory testing and grouped by soil type. The soil type numbers are included on the Test Boring Logs. It should be understood that the soil descriptions shown on the Test Boring Logs may vary between boring location and sample depth.

It should also be noted that the lines of stratigraphic separation shown on the Test Boring Logs represent approximate boundaries between soil types and the actual stratigraphic transitions may be more gradual and vary with location. The Test Boring Logs are presented in Appendix A.

Moisture Content, ASTM D-2216, was obtained in the laboratory for all recovered samples. Grain-Size, ASTM D-422, and Atterberg Limits, ASTM D-4318, were determined for various samples for the purpose of classification and to obtain pertinent engineering characteristics. Swell/Consolidation testing and FHA Swell testing were performed on selected samples to evaluate the expansion/consolidation characteristics of the soils. Sulfate testing was performed to evaluate the soils corrosiveness. The Laboratory Test Results are included in Appendix B and summarized in Table 2.

4.0 SUBSURFACE CONDITIONS

Two soil types and two bedrock types were encountered in the borings drilled for the subsurface investigation: Type 1: silty to clayey sand and slightly silty sand (SM-SW, SM-SC); Type 2: very clayey sand (SC); Type 3: silty sandstone (SM); and Type 4: sandy claystone (CL). The soils were classified in accordance with the Unified Soil Classification System (USCS) using the laboratory testing results and the observations made during drilling.

4.1 Soil and Rock

Soil Type 1 is silty to clayey sand and slightly silty sand (SM-SW, SM-SC). The sand was encountered in both of the test borings at the existing ground surface and extending to 9 to 12 feet bgs. Standard Penetration Testing conducted on the sand resulted in N-values of 7 to 33 bpf, which indicated loose to dense states. Moisture content and grain size testing resulted in moisture contents of 1 to 11 percent with approximately 9 and 18 percent of the soil size particles passing the No. 200 sieve. Atterberg limits testing was performed on a sample of slightly silty sand in Test Boring No.1 resulted in liquid limits of No Value and a plastic index of Non-Plastic. An FHA Swell test was performed on a sample of silty, clayey sand which resulted in an expansion pressure of 130 psf. This magnitude of expansion is in the low expansion range. A sulfate test resulted in less than 0.01 percent sulfate by weight, which indicates negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 2 is a very clayey sand (SC). The very clayey sand was encountered in Test Boring No.1 at a depth of 9 to 11 feet bgs. Standard Penetration Testing of the very clayey sand resulted in an N-value of 21 bpf, indicating the sand is at medium dense states. Moisture content and grain size testing resulted in a moisture content of 18 percent with approximately 42 percent of the soil size particles passing the No. 200 sieve. Atterberg limits testing was performed and resulted in the very clayey sand having a liquid limit of 41 and a plastic index of 21. A Swell/Consolidation Test resulted in no volume change. A sulfate test resulted in less than 0.01 percent sulfate by weight, which indicates negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 3 is a silty sandstone (SM). The silty sandstone was encountered in both of the test borings at depths ranging from 11 to 12 feet bgs and extending to 19 feet and to the termination of the test borings (20 feet bgs). Standard Penetration Testing on the sandstone resulted in N-values of greater than 50 bpf, which is at very dense states. Moisture content and grain size testing resulted in moisture contents of 10 to 13 percent with approximately 16 percent of the soil size particles passing the No. 200 sieve. Atterberg limits testing indicated that the sandstone is non-plastic. A sulfate test resulted in less than 0.01 percent sulfate by weight, which indicates negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 4 is sandy claystone (CL). The sandy claystone was encountered in Test Boring No. 2 at a depth of 19 feet bgs and extending to the termination of the test boring (20 feet bgs). Standard Penetration Testing conducted on the sandy claystone resulted in an N-value of greater than 50 bpf, which indicated hard consistencies. Moisture content and grain size testing resulted in a moisture content of 15 percent with approximately 76 percent of the soil size particles passing the No. 200 sieve. A Swell/Consolidation Test indicated a volume change of 1.0 percent, which is in the moderate expansion range for a sample of sandy claystone.

Additional descriptions and engineering properties of the soil encountered during drilling are included on the boring logs. Laboratory Testing Results are summarized on Table 1 and presented in Appendix B. It should be understood that the soil descriptions reported on the boring logs may vary between boring locations and sampling depths. Similarly, the lines of stratigraphic separation shown on the boring logs represent approximate boundaries between soil types and the actual transitions between types may be more gradual or variable.

4.2 Groundwater

Groundwater was encountered at 7 and 17 feet bgs in the test borings subsequent to drilling. Groundwater is not expected to affect the construction of the shallow foundation with slab-on-grade floors proposed for this site. However, development of this and adjacent properties, as well as seasonal precipitation changes, and changes in runoff may affect groundwater elevations.

5.0 GEOTECHNICAL EVALUATION AND RECOMMENDATIONS

The following discussion is based on the subsurface conditions encountered in the borings drilled in the planned building footprint. If subsurface conditions different from those described herein are encountered during construction or if the project elements change from those described, Entech Engineering, Inc. should be notified so that the evaluation and recommendations presented can be reviewed and revised if necessary.

The soils encountered on this site consisted of silty to clayey sand and slightly silty sand overlying very clayey sand with underlying silty sandstone and sandy claystone. The upper granular soils were generally encountered at loose to dense states. The proposed building is expected to have slab-on-grade floors with no basement or below grade slab levels. Given the subsurface conditions encountered at the time of drilling and the site development as described, a shallow foundation resting on medium dense to dense sands, or recompacted sands is recommended for the site. If loose or expansive materials are encountered at the foundation level, penetration or overexcavation and replacement of the expansive material with structural fill and recompaction of loose granular materials to a minimum of 95% of its maximum Modified Proctor Dry Density, ASTM D-1557 is anticipated. The need for removal and replacement or recompaction will be determined at the time of the excavation observation.

Excavation of site sands should be moderate with rubber-tired equipment. Site sands may be acceptable for use as structural fill, pending approval.

5.1 Subgrade Improvements and Bearing Capacity

The structure can be supported with a shallow foundation resting on medium dense sands, structural fill, or on recompacted sands. Loose soils encountered beneath foundation components or floor slabs, will require removal and recompaction according to the "Structural Fill" paragraph. Any fill should be placed to the requirements of the "Structural Fill" paragraph. On-site granular sands may acceptable as structural fill.

Provided the above recommendations are followed, an allowable bearing pressure of 2000 psf is recommended for the medium dense to dense sand or recompacted sands. For final design, continuous spread footings are recommended to have a minimum width of 16 inches, and individual column footings should have minimum plan dimensions of 24 inches on each side. Exterior footings should extend a minimum of 30 inches below the adjacent exterior surface grade for frost protection. Following the above foundation subgrade preparation recommendations, and adhering to the recommended maximum allowable bearing pressure, it is expected to result in foundation designs which should limit total and differential vertical movements up to 1 and ½ inches, respectively.

Foundation excavations are recommended to extend at least 3 feet horizontally beyond the foundation wall limits (inside and outside) in order to provide adequate space for installation of drain materials (if necessary) and placement of controlled fill. All foundation excavation side slopes should be inclined at angles of 1½ horizontal to 1 vertical or flatter, as necessary, to provide for excavation sidewall stability during construction or as required by OSHA regulations. Entech should observe any overexcavated subgrades as well as the overall foundation excavation subgrade and evaluate if the exposed conditions are consistent with those described in this report. Entech should also provide recommendations for overexcavation depth, if necessary, and the need for drain systems based on the excavation conditions observed at that time.

Foundation walls should be designed to resist lateral pressures generated by the soils on this site. An equivalent hydrostatic fluid pressure (in the active state) of 40 pcf is recommended for the granular site soils. It should be noted that this value applies to level backfill conditions. If groundwater is present or sloping backfill conditions exist, pressures will increase substantially depending on the conditions adjacent to the walls. Surcharge loading should also be considered in wall designs. Equivalent fluid pressures for sloping conditions should be determined on an individual basis.

5.2 Site Seismic Classification

Based on the subsurface conditions encountered at the site and in accordance with Section 1613 of the 2009 International Building Code (IBC), the site meets the conditions of a Site Class D.

5.3 On-Grade Floor Slabs

The floor slabs may be supported on the medium dense sand or on recompacted loose sand. The floor slab subgrade should be scarified to 12 inches deep, moisture-conditioned to within 2 percent of optimum moisture, and compacted to minimum of 95 percent of its maximum Modified Proctor Dry Density ASTM D-1557. Backfill placed below floor slabs should be non-expansive and be compacted to a minimum of 95 percent of its maximum Modified Proctor Dry Density (ASTM D- 1557).

Grade supported floor slabs should be separated from other building structural components and utility penetrations to allow for possible future vertical movement unless they are designed as part of the foundation system. Interior partition walls should be constructed in such a manner so as not to transfer slab movement into the overlying floor(s) and/or roof members, should slab movement occur. Control joints in grade-supported slabs are recommended and should be placed according to ACI Guidelines.

5.4 Surface and Subsurface Drainage

Positive surface drainage must be maintained around the structure to minimize infiltration of surface water. A minimum gradient of 5 percent in the first 10 feet adjacent to foundation walls is recommended. A minimum gradient of 2 percent is recommended for paved areas. All grades should be directed away from the structure. All downspouts should be extended to discharge well beyond the backfill zone of the structure.

A subsurface perimeter drain is not required providing the slab is located above exterior grade, interior and exterior backfill is properly compacted, surface grading is maintained and irrigation is minimized. A subsurface perimeter drain is recommended for useable space below finished grade. A typical drain detail is shown in Figure 3. The drain should be provided with a free gravity outlet or be connected to a sewer underdrain. If such an outlet or connection is not available within a reasonable distance from the structure, a sump and pump system would be required.

To help minimize infiltration of water into the foundation zone, vegetative plantings placed close to foundation walls should be limited to those species having low watering requirements and irrigated grass should not be located within 5 feet of the foundation. Similarly, sprinklers are not recommended to discharge water within 5 feet of foundations. Irrigation near foundations should be limited to the minimum amount sufficient to maintain vegetation. Application of more irrigation water than necessary can increase the potential for slab and foundation movement.

5.5 Concrete

Soluble sulfate testing was conducted on three samples of the site soils to evaluate the potential for sulfate attack on concrete placed below the surface grade. The test results indicated less than 0.01 percent soluble sulfate by weight for the site soils. The test results indicate the sulfate component of the in-place site soils present a negligible exposure threat to concrete placed below grade that comes into contact with the site soils.

Type II cement is recommended for concrete at this site. To further avoid concrete degradation during construction it is recommended that concrete not be placed on frozen or wet ground. Care should be taken to prevent the accumulation or ponding of water in the foundation excavation prior to the placement of concrete. If standing water is present in the foundation excavation, it should be removed by ditching to sumps and pumping the water away from the foundation area prior to concrete placement. If concrete is placed during periods of cold temperatures, the concrete must be kept from freezing. This may require covering the concrete with insulated blankets and adding heat to prohibit freezing.

5.6 Foundation Excavation Observation

Subgrade preparation for building foundations should be observed by Entech prior to construction of the footings and floor slab in order to verify that (1) no anomalies are present, (2) materials of the proper bearing capacity have been encountered or placed, and (3) no soft, loose, uncontrolled fill material, expansive soil or debris are present in the foundation area prior to concrete placement or backfilling. Entech should make final recommendations for over-excavation, if required, and foundation drainage at the time of excavation observation, if necessary.

5.7 Structural Fill

Areas to receive fill should have all topsoil, organic material or debris removed. Fill must be properly benched. The surface should be scarified and moisture conditioned to within ±2 percent of its optimum moisture content and compacted to 95 percent of its maximum Modified Proctor Dry Density (ASTM D-1557) beneath footings or floor slabs prior to placing new fill. New fill beneath footings should be non-expansive and be placed in thin lifts not to exceed 6 inches after compaction while maintaining at least 95 percent of its maximum Modified Proctor Dry Density (ASTM D-1557). These materials should be placed at a moisture content conducive to compaction, usually ±2 percent of Proctor optimum moisture content. The placement and compaction of fill should be observed and tested by Entech. Imported soils should be approved by Entech prior to being hauled to the site and on-site granular soils prior to placement.

Compacted, non-expansive granular soil, free of organics, debris and cobbles greater than 3-inches in diameter, is recommended for filling foundation components and for filling beneath floor slabs. All fill placed within the foundation area should be non-expansive and be compacted to a minimum of 95 percent of the soils maximum dry density as determined by the Modified Proctor Test (ASTM D-1557). Fill material placed beneath floor slabs should be compacted to a minimum of 95 percent of its maximum Modified Proctor Dry Density, ASTM D-1557. Fill material should be placed in horizontal lifts such that each finished lift has a compacted thickness of six inches or less. Fill should be placed at water contents conducive to achieving adequate compaction, usually within ±2 percent of the optimum water content as determined by ASTM D-1557. Mechanical methods can be used for placement and compaction of fill; however, heavy equipment should be kept at distance from foundation walls and below slab infrastructure to avoid overstressing. No water flooding techniques of any type should be used for compaction or placement of foundation or floor slab fill material.

5.8 Utility Trench Backfill

Fill placed in utility trenches should be compacted to a minimum of 95 percent of its maximum dry density as determined by the Standard Proctor Test (ASTM D-698) for cohesive soils and 95 percent as determined by the Modified Proctor Test (ASTM D-1557) for cohesionless soils. Fill should be placed in horizontal lifts having a compacted thickness of six inches or less and at a water content conducive to adequate compaction, within ±2 percent of the optimum water content. Mechanical methods should be used for fill placement; however, heavy equipment should be kept at a distance from foundation walls. No water flooding techniques of any type should be used for compaction or placement of utility trench fill.

Trench backfill placement should be performed in accordance with El Paso Country specifications. All excavation and excavation shoring/bracing should be performed in accordance with OSHA guidelines.

5.9 General Backfill

Any areas to receive fill outside the foundation limits should have all topsoil, organic material, and debris removed. Fill must be properly benched into existing slopes in order to be adequately compacted. The fill receiving surface should be scarified to a depth of 12-inches and moisture conditioned to ± 2 percent of the optimum water content, and compacted to a minimum of 95 percent of the ASTM D-1557 maximum dry density before the addition of new fill. Fill should be placed in thin lifts not to exceed 6 inches in thickness after compaction while maintaining at least 95 percent of the ASTM D-1557 maximum dry density. Fill material should be free of vegetation and other unsuitable material and shall not contain rocks or fragments greater than 3-inches. Topsoil and strippings should be segregated from all other fill sources on the site. Fill placement and compaction beneath and around foundations, in utility trenches, beneath roadways or other structural features of the project should be observed and tested by Entech during construction.

5.10 Excavation Stability

Excavation sidewalls must be properly sloped, benched and/or otherwise supported in order to maintain stable conditions. All excavation openings and work completed therein shall conform to OSHA Standards as put forward in CFR 29, Part 1926.650-652, (Subpart P).

5.11 Winter Construction

In the event construction of the planned facility occurs during winter, foundations and subgrades should be protected from freezing conditions. Concrete should not be placed on frozen soil and once concrete has been placed, it should not be allowed to freeze. Similarly, once exposed, the foundation subgrade should not be allowed to freeze. During site grading and subgrade preparation, care should be taken to eliminate burial of snow, ice or frozen material within the planned construction area.

5.12 Construction Observations

It is recommended that Entech observe and document the following activities during construction of the building foundations.

- Excavated subgrades and subgrade preparation.
- Placement of drains (if installed).
- Placement/compaction of fill material for the foundation components or floor slab.
- Placement/compaction of utility bedding and trench backfill.

6.0 CLOSURE

The subsurface investigation, geotechnical evaluation and recommendations presented in this report are intended for use JP Nelson and Associates with application to the pre-engineered metal aircraft hangar and associated site improvements at 8140 and 8150 Cessna Drive, located in the eastern portion of El Paso County, Colorado. In conducting the subsurface investigation, laboratory testing, engineering evaluation and reporting, Entech Engineering, Inc. endeavored to work in accordance with generally accepted professional geotechnical and geologic practices and principles consistent with the level of care and skill ordinarily exercised by members of the geotechnical profession currently practicing in same locality and under similar conditions. No other warranty, expressed or implied is made. During final design and/or construction, if conditions are encountered which appear different from those described in this report, Entech Engineering, Inc. requests that it be notified so that the evaluation and recommendations presented herein can be reviewed and modified as appropriate.

If there are any questions regarding the information provided herein or if Entech Engineering, Inc. can be of further assistance, please do not hesitate to contact us.

TABLE

TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

CLIENT JP NELSON
PROJECT 8140-8150 CESSNA DRIVE
JOB NO. 210695

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	1	2-3			9.2	NV	NP	<0.01			SM-SW	SAND, SLIGHTLY SILTY
1	2	10			18.2				130		SM-SC	SAND, SILTY, CLAYEY
2	1	10	13.3	118.3	41.6	41	21	<0.01		0.0	SC	SAND, VERY CLAYEY
3	1	15			15.8	NV	NP	<0.01			SM	SANDSTONE, SILTY
4	2	20	12.3	121.8	75.5					1.0	CL	CLAYSTONE, SANDY

FIGURES

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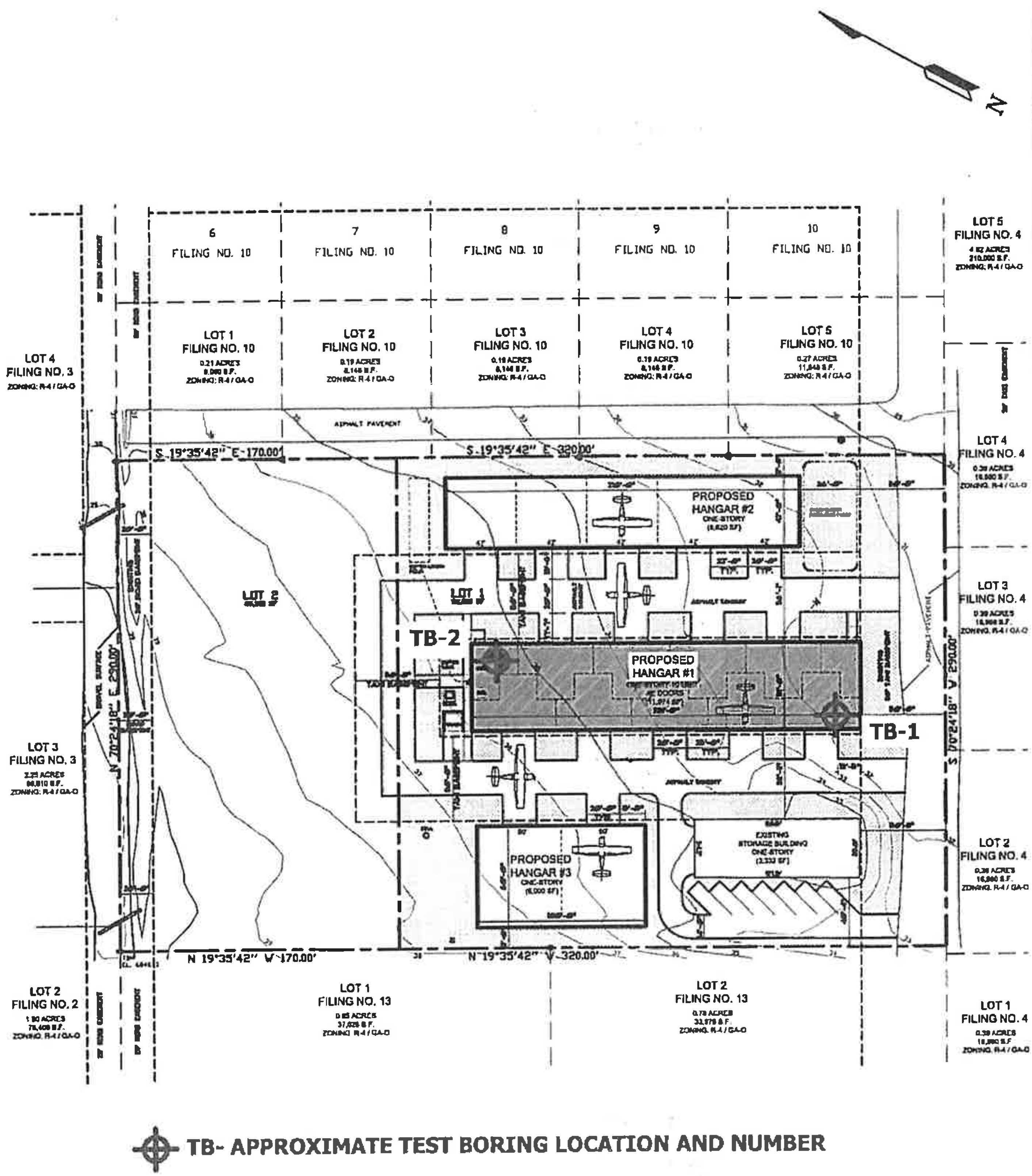
VICINITY MAP
8140 AND 8150 CESSNA DRIVE
EL PASO COUNTY, CO.
FOR: JP NELSON & ASSOCIATES

DRAWN:	DATE:	CHECKED:	DATE:
RPJ	4/20/21	DPS	4/20/21

JOB NO.: 210695

FIG NO.: 1



TB- APPROXIMATE TEST BORING LOCATION AND NUMBER

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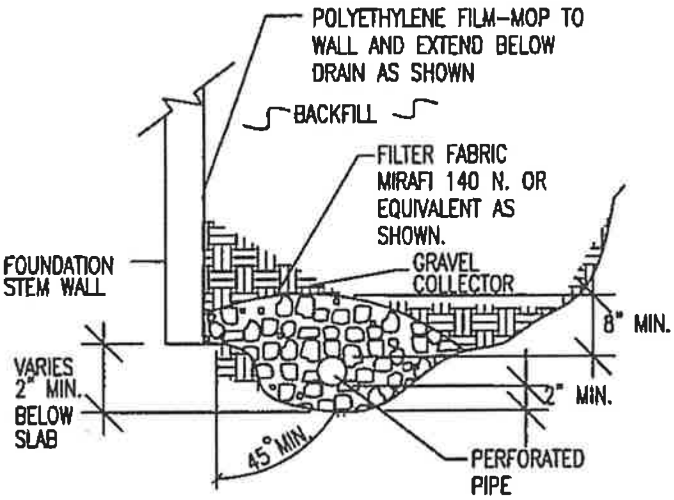
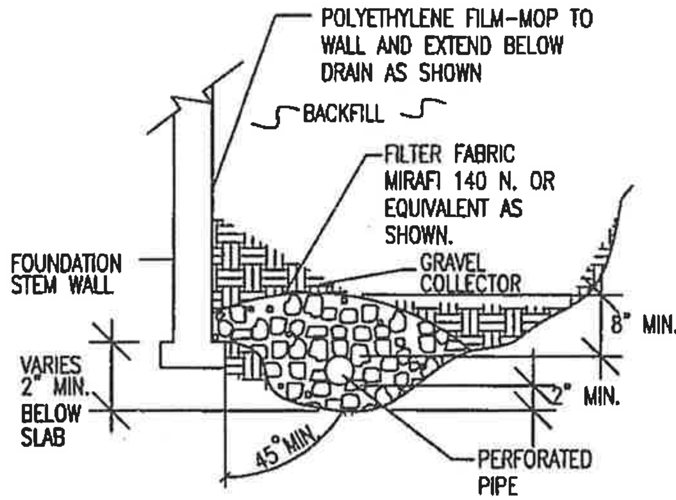
TEST BORING LOCATION MAP
8140 AND 8150 CESSNA DRIVE
EL PASO COUNTY, CO.
FOR: JP NELSON & ASSOCIATES

DRAWN:	DATE:	CHECKED:	DATE:
RPJ	4/20/21	DPS	4/20/21

JOB NO.: 210695

FIG NO.: 2





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.: 210695

FIG NO.: 3

APPENDIX A: Test Boring Logs

TEST BORING NO.	1
DATE DRILLED	3/26/2021
Job #	210695

REMARKS

WATER @ 17', 4/12/21

Description	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
SAND, SLIGHTLY SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE TO LOOSE, DRY		■	18	1.0	1
	5	■	7	2.8	1
SAND, VERY CLAYEY, FINE GRAINED, GRAY BROWN, MEDIUM DENSE, MOIST	10	■	21	18.2	2
SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, MOIST	15	■	50/9"	12.8	3
	20	■	50/6"	12.1	3

TEST BORING NO.	2
DATE DRILLED	3/26/2021
CLIENT	JP NELSON
LOCATION	8140-8150 CESSNA DRIVE

REMARKS

WATER @ 7', 4/12/21

Description	Depth (ft)	Samples	Blows per foot	Watercontent %	Soil Type
SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, DRY		■	14	2.7	1
	5	■	15	1.8	1
SAND, SILTY, CLAYEY, FINE TO COARSE GRAINED, GRAY BROWN, DENSE, VERY MOIST	10	■	33	11.0	1
SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, MOIST	15	■	50/7"	10.4	3
CLAYSTONE, SANDY, GRAY BROWN, HARD, MOIST	20	■	50/6"	14.5	4

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TEST BORING LOG

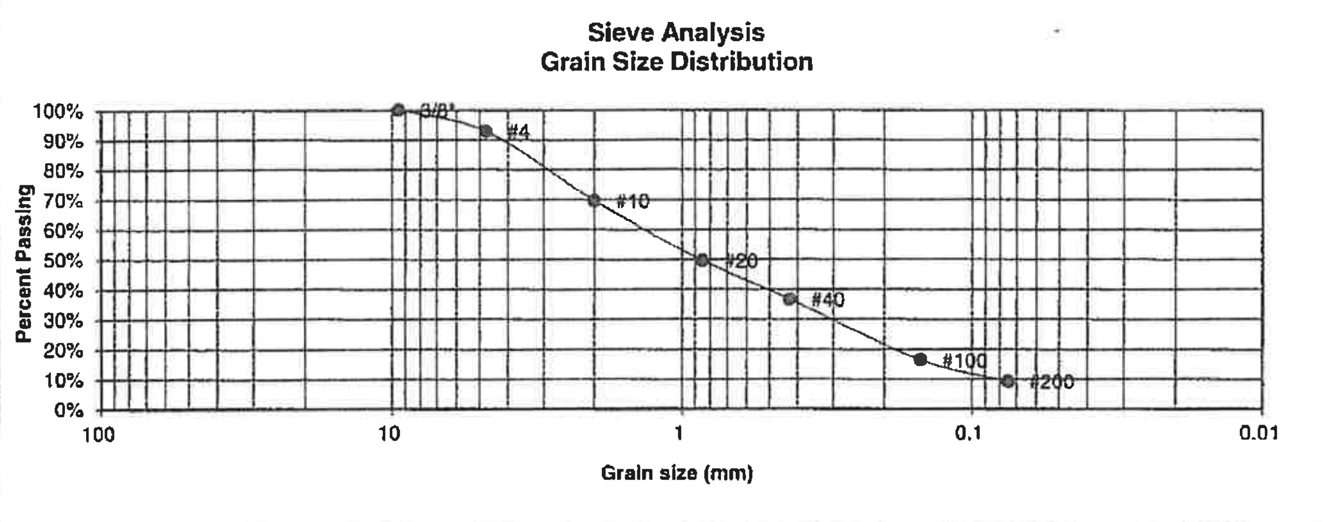
DRAWN:	DATE:	CHECKED:	DATE:
		[signature]	4/15/21

JOB NO.: 210695

FIG NO.: A- 1

APPENDIX B: Laboratory Test Results

UNIFIED CLASSIFICATION	SM-SW	CLIENT	JP NELSON
SOIL TYPE #	1	PROJECT	8140-8150 CESSNA DRIVE
TEST BORING #	1	JOB NO.	210695
DEPTH (FT)	2-3	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	92.9%
10	69.6%
20	49.6%
40	36.6%
100	16.3%
200	9.2%

Atterberg
Limits

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

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

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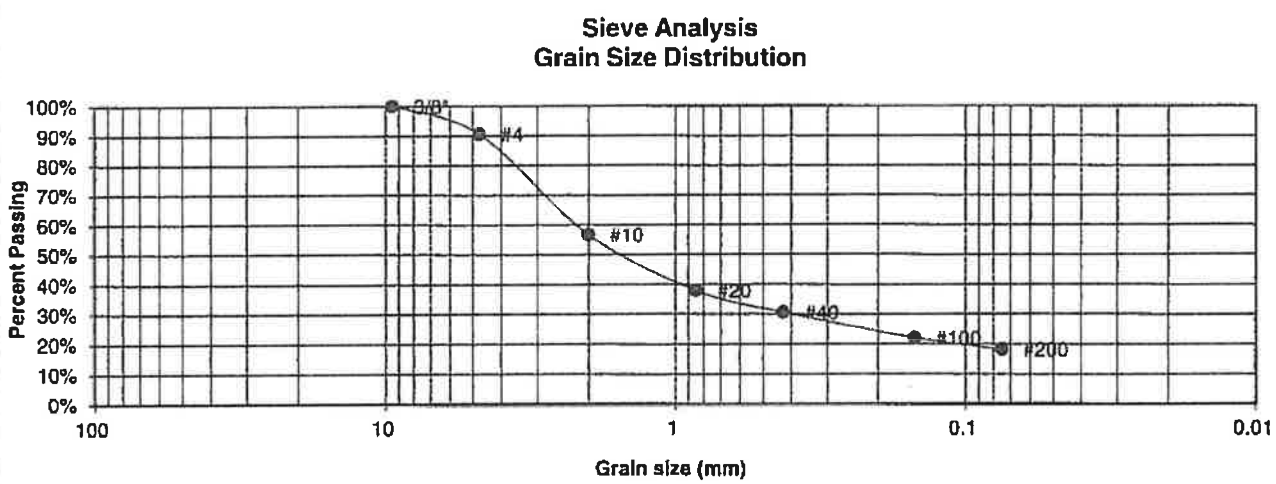
COLORADO SPRINGS, COLORADO 80907

LABORATORY TEST RESULTS

DRAWN:	DATE	CHECKED:	DATE: 4/15/21

JOB NO.: 210695
FIG NO.: B-1

UNIFIED CLASSIFICATION	SM-SC	CLIENT	JP NELSON
SOIL TYPE #	1	PROJECT	8140-8150 CESSNA DRIVE
TEST BORING #	2	JOB NO.	210695
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	90.6%
10	56.6%
20	37.9%
40	30.5%
100	22.0%
200	18.2%

Atterberg
Limits

Plastic Limit
Liquid Limit
Plastic Index

Swell

Moisture at start	8.5%
Moisture at finish	20.5%
Moisture increase	12.0%
Initial dry density (pcf)	104
Swell (psf)	130

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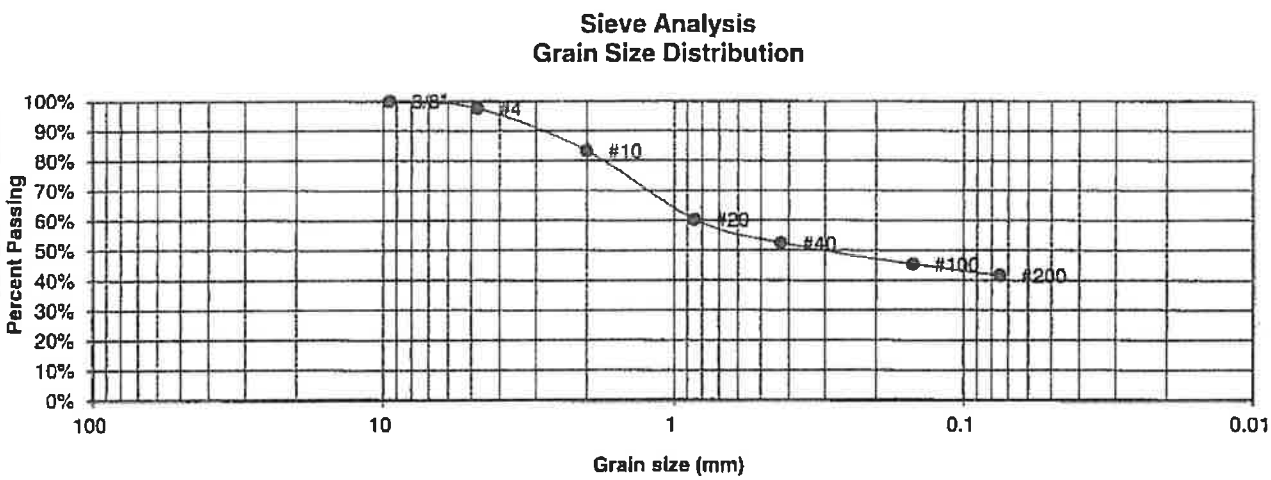
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		4~	4/15/21

JOB NO.: 210695

FIG NO.: B-2

UNIFIED CLASSIFICATION	SC	CLIENT	JP NELSON
SOIL TYPE #	2	PROJECT	8140-8150 CESSNA DRIVE
TEST BORING #	1	JOB NO.	210695
DEPTH (FT)	10	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	97.6%
10	83.2%
20	60.3%
40	52.4%
100	45.3%
200	41.6%

Atterberg Limits	
Plastic Limit	20
Liquid Limit	41
Plastic Index	21

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

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505 ELKTON DRIVE
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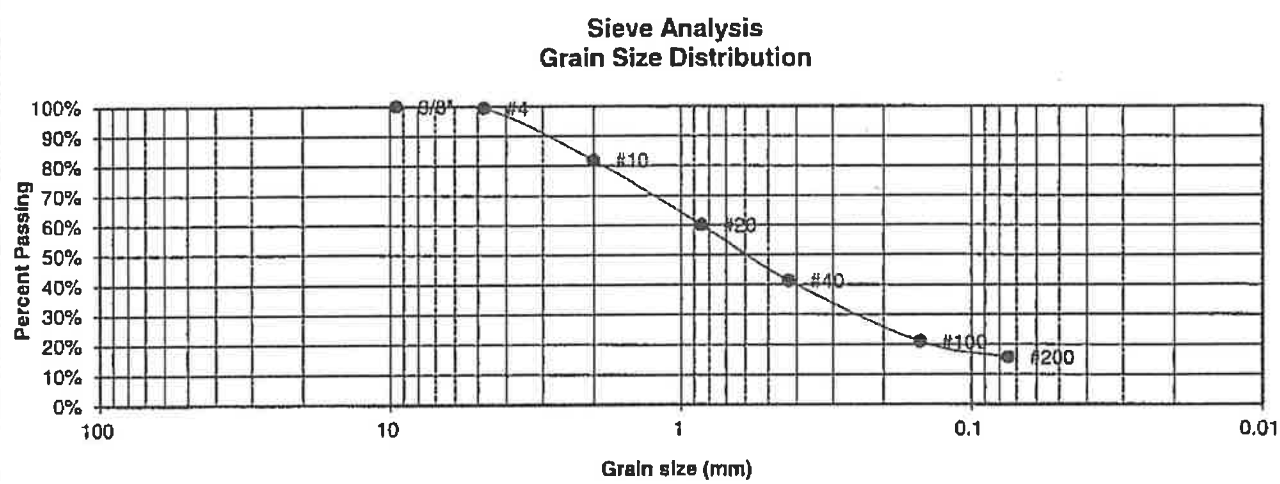
LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		[illegible]	4/15/21

JOB NO.: 210695

FIG NO.: B-3

UNIFIED CLASSIFICATION	SM	CLIENT	JP NELSON
SOIL TYPE #	3	PROJECT	8140-8150 CESSNA DRIVE
TEST BORING #	1	JOB NO.	210695
DEPTH (FT)	15	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.4%
10	81.8%
20	60.0%
40	41.2%
100	20.9%
200	15.8%

Atterberg
Limits

Plastic Limit	NP
Liquid Limit	NV
Plastic Index	NP

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

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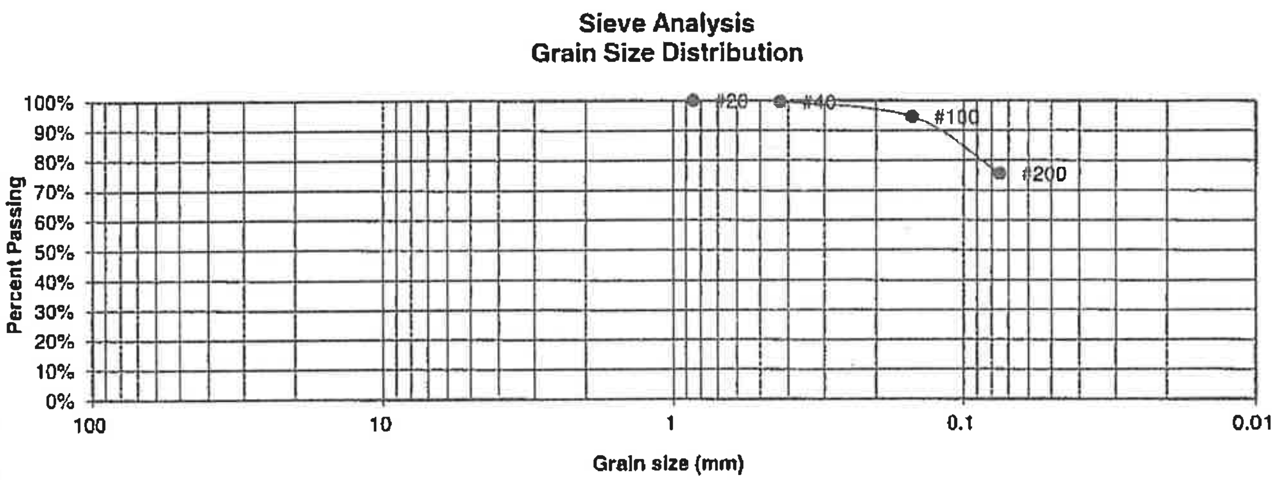
LABORATORY TEST RESULTS

DRAWN: DATE: CHECKED: L DATE: 4/15/21

JOB NO.: 210695

FIG NO.: B-4

UNIFIED CLASSIFICATION	CL	CLIENT	JP NELSON
SOIL TYPE #	4	PROJECT	8140-8150 CESSNA DRIVE
TEST BORING #	2	JOB NO.	210695
DEPTH (FT)	20	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	
10	
20	100.0%
40	99.6%
100	94.5%
200	75.5%

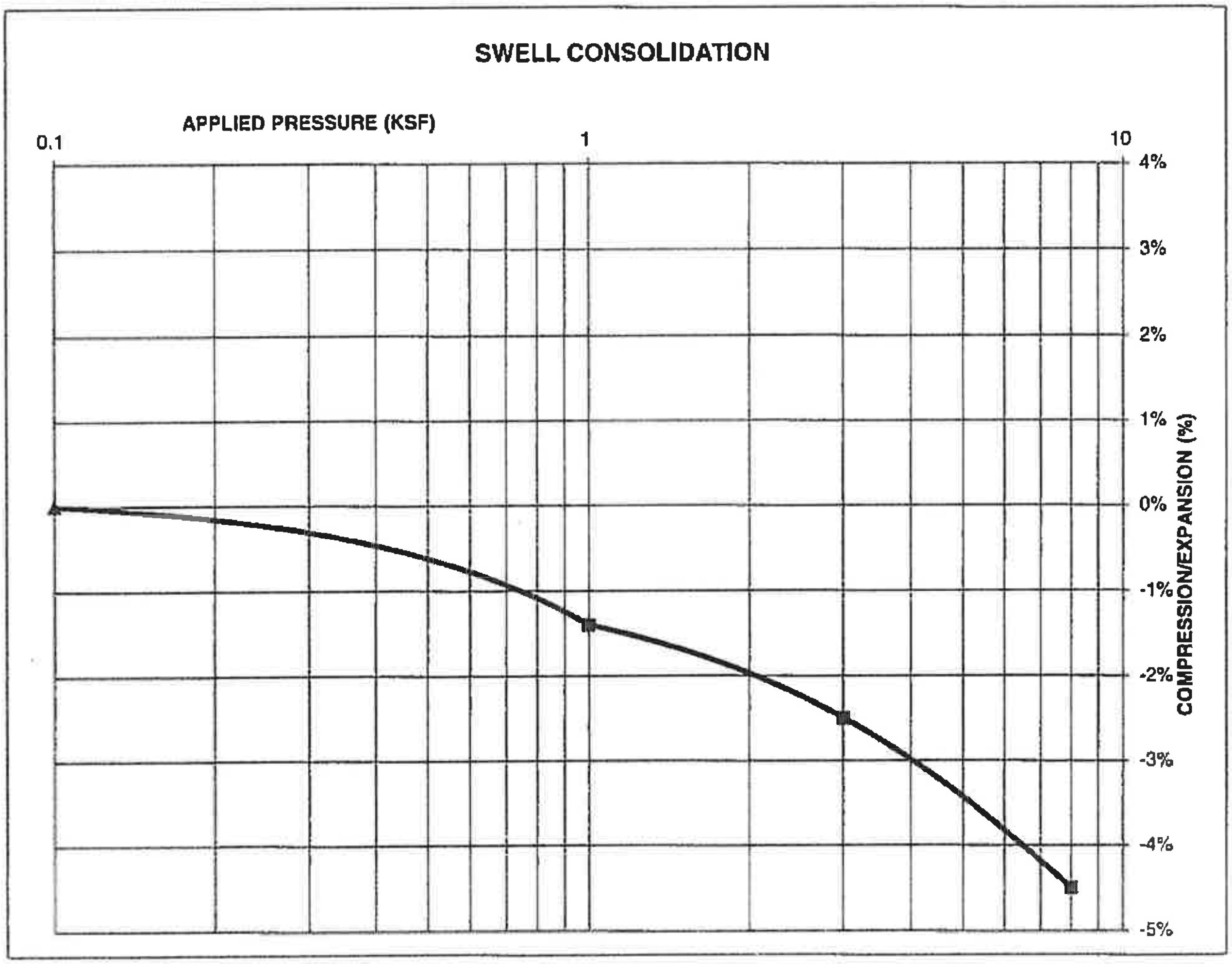
Atterberg
Limits
Plastic Limit
Liquid Limit
Plastic Index

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

CONSOLIDATION TEST RESULTS

TEST BORING #	1	DEPTH(ft)	10
DESCRIPTION	SC	SOIL TYPE	2
NATURAL UNIT DRY WEIGHT (PCF)			118
NATURAL MOISTURE CONTENT			13.3%
SWELL/CONSOLIDATION (%)			0.0%

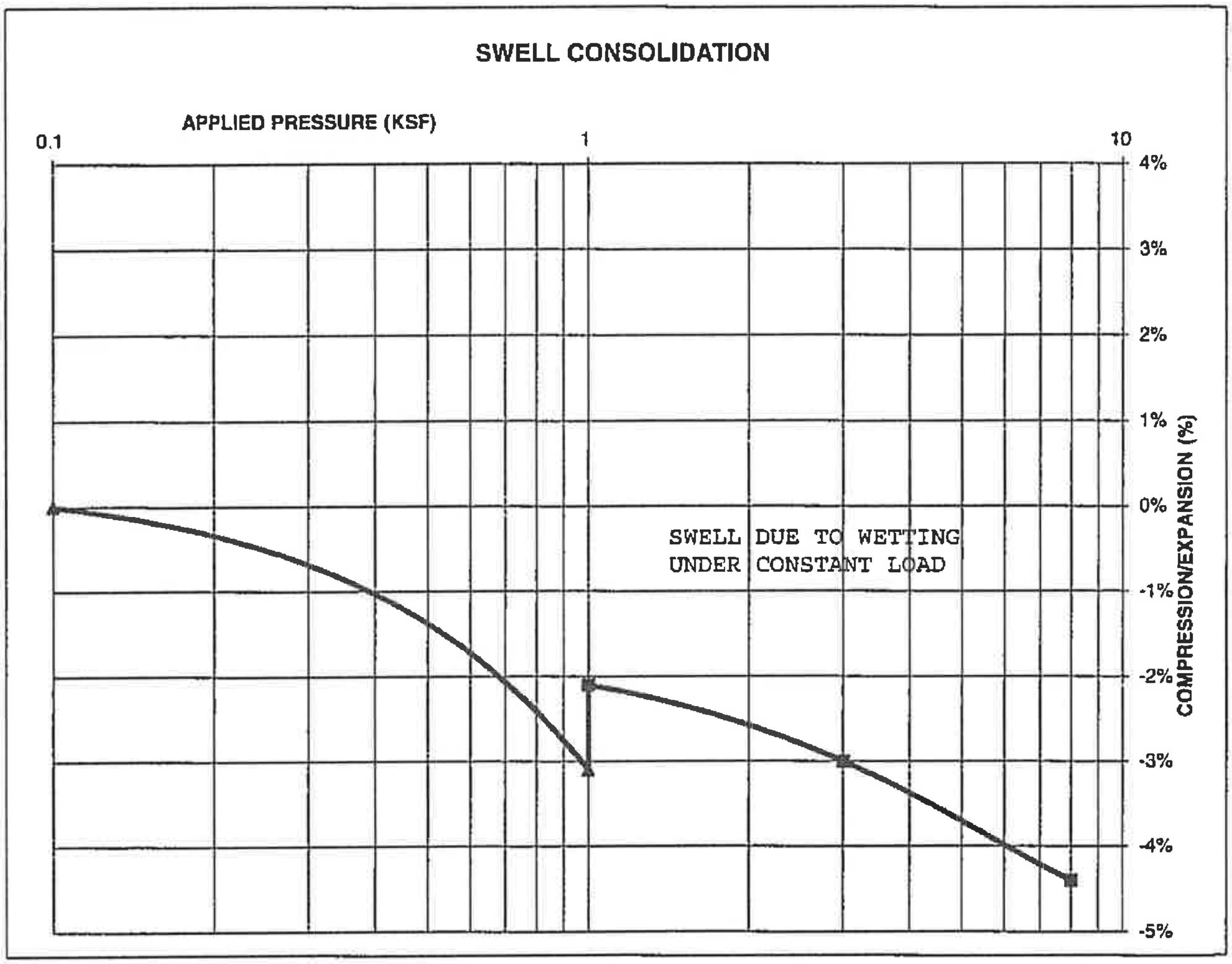
JOB NO. 210695
CLIENT JP NELSON
PROJECT 8140-8150 CESSNA DRIVE



CONSOLIDATION TEST RESULTS

TEST BORING #	2	DEPTH(ft)	20
DESCRIPTION	CL	SOIL TYPE	4
NATURAL UNIT DRY WEIGHT (PCF)			122
NATURAL MOISTURE CONTENT			12.3%
SWELL/CONSOLIDATION (%)			1.0%

JOB NO. 210695
CLIENT JP NELSON
PROJECT 8140-8150 CESSNA DRIVE



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SWELL CONSOLIDATION TEST RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		[signature]	4/15/21

JOB NO.: 210695

FIG NO.: B-7

CLIENT	JP NELSON	JOB NO.	210695
PROJECT	8140-8150 CESSNA DRIVE	DATE	4/5/2021
LOCATION	8140-8150 CESSNA DRIVE	TEST BY	BL

BORING NUMBER	DEPTH, (ft)	SOIL TYPE NUMBER	UNIFIED CLASSIFICATION	WATER SOLUBLE SULFATE, (wt%)
TB-1	2-3	1	SM-SW	<0.01
TB-1	15	3	SM	<0.01
TB-1	10	2	SC	<0.01

QC BLANK PASS

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LABORATORY TEST
SULFATE RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		A	4/15/21

JOB NO.: 210695

FIG NO.: B-8