This is a site dev plan report not a subdivision report. Please see the Code, Section 8.4.9. for requirements. There are hazards (constraints) that need to be identified on the plat (No preliminary plan was completed previously). The natural features report indicates 4 soil types and a constraint to be removed.

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

SUBSURFACE SOIL INVESTIGATION
BIG O TIRES
6985 MERIDIAN ROAD
FALCON, COLORADO

Prepared for:

Hammers Construction
1411 Woolsey Heights
Colorado Springs, Colorado 80915

Attn: Joe Butler

October 20, 2017

Respectfully Submitted,

ENTECH ENGINEERING, INC.

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

KAH/rm

Encl.

Entech Job No. 171206
AAprojects/2017/171206 ssi

COLORADO LICENSED
MARK HOWARD HAUSCHILD
35140
10/20/17
PROFESSIONAL ENGINEER

Reviewed by:

Mark H. Hauschild, P.E.
Senior Engineer

Add "PCD File No. SF-18-003"

Table of Contents

SUBSURFACE SOIL INVESTIGATION
BIG O TIRES
6985 MERIDIAN ROAD
FALCON, COLORADO

1.0 INTRODUCTION

Hammers Construction is planning the construction of a Big O Tires building on a site located at 6985 Meridian Road, in Falcon, Colorado. The approximate location of the project site is shown on the Vicinity Location Map, Figure 1. The proposed development plan 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 test borings at two locations in the footprint of the planned 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 our understanding that the project will consist of the construction of a new 4,710 square foot auto service building with a 1,120 square foot retail/sales building and associated site improvements. The building will utilize slab-on-grade floors. At the time of drilling, structures on the site consisted of an Espresso X coffee shop, and Falcon Farm Market. The building area is generally flat. The site is located south of Highway 24 and east of Meridian Road in Falcon, Colorado.

3.0 SUBSURFACE EXPLORATIONS AND LABORATORY TESTING

The subsurface conditions were investigated by drilling two exploratory test borings within the proposed building footprint at the locations shown in Figure 2. The borings were drilled to 20 feet below the existing ground surface. The drilling was performed using a truck-mounted continuous flight auger-drilling rig supplied and operated by Entech Engineering, Inc. Boring Logs description of the subsurface conditions encountered during drilling is presented in Appendix A. At the conclusion of drilling and subsequent to drilling, observations of groundwater levels were made in each of the open borings.

Soil samples were obtained from the borings utilizing the Standard Penetration Test (ASTM D-1586) using a 2-inch O.D. split-barrel sampler and 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. 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 testing, ASTM D-422 and Atterberg limits testing were performed on various samples for the purpose of classification and to obtain pertinent engineering characteristics. Sulfate testing was performed to evaluate the corrosive characteristics of the soils. The Laboratory Test Results are included in Appendix B and summarized in Table 1.

This is for the creation of a lot. 3 soils were identified in the building pad area. A boring is required for each soil type within the proposed subdivision (outside of building area) See Section 8.4.9
NOTE:
4 soil types are noted in the natural feature s report for the proposed lot. An abandoned but not removed septic system is also noted.

4.0 SUBSURFACE CONDITIONS

Three soil types were encountered in the borings drilled for the subsurface investigation: Type 1A: silty sand fill (SM), Type 1: silty to slightly silty sand (SM, SM-SW) and Type 2: silty sandstone (SM). The soil types 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

Soil Type 1A is a silty sand fill (SM). The sand was encountered in Test Boring No. 1 at the existing surface and extending to depth of 3 feet below the ground surface (bgs). Standard Penetration Testing on the sand fill resulted in SPT N-value of 6 bpf, which indicates loose states. Water content analysis conducted on a sample resulted in water contents of approximately 8 percent.

Soil Type 1 is a silty to slightly silty sand (SM, SM-SW). The sand was encountered in both of the test borings at the existing surface and 3 feet bgs extending to depths ranging from 17 feet below the ground surface (bgs) to the termination of the test boring (20 feet). Standard Penetration Testing on the sand resulted in SPT N-values ranging from 3 to 30 bpf, which indicates very loose to dense states. Water content and grain size analysis conducted on samples resulted in water contents of approximately 2 to 15 percent, with approximately 6 to 18 percent of the soil size particles passing the No. 200 sieve. Atterberg limits testing resulted in a liquid limit of 24 and a plastic index of 2. Sulfate testing resulted in less than 0.01 percent soluble sulfate by weight, indicating a negligible potential for below grade concrete degradation due to sulfate attack.

Soil Type 2 is a silty sandstone (SM). The sandstone was encountered in Test boring No. 1 below the sand at 17 feet bgs and extending to the termination of the boring (20 feet). Standard Penetration Testing on the sandstone resulted in SPT N-values of greater than 50 bpf, which indicates very dense states. Water content and grain size analysis conducted on a sample resulted in water contents of approximately 10 percent, with approximately 19 percent of the soil size particles passing the No. 200 sieve.

Additional descriptions and engineering properties of the soil encountered during drilling are included on the boring logs (Appendix A). 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 in both of the test borings at depths ranging from 10 to 10.5 feet. It is anticipated groundwater will not affect the construction of shallow foundations with slab on grade floors on this site. Unstable conditions should be expected where excavations approach the groundwater level. Stabilization using geo-grids or shot rock may be necessary. Develop easonal precipitation changes, and changes

Provide evaluation/recommendation for the foundation preparation and embankment construction for the permanent detention facility.

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 site will be developed by constructing a new 4,710 square foot auto service building with a 1,120 square foot retail/sales building and associated site improvements. Given the subsurface conditions encountered at the time of drilling and the site development as described, it is anticipated that a shallow foundation resting on the medium dense to dense native sands, recompacted loose sands, or structural fill will be utilized. The native medium dense to dense granular soils encountered in the test borings are suitable to support the shallow foundation. SPT N-values measured in the native sands indicated very loose to dense conditions. Loose soils should be penetrated or removed and recompacted according to the "Structural Fill" paragraph. Three feet of fill was encountered in Test Boring No. 1. The fill is considered to be uncontrolled. Uncontrolled fill is not suitable bearing material for footings and slabs. If expansive soils are encountered within 4 feet of foundation components, the expansive soils should be

overexcavated and replaced with non-expansive structural fill compacted according to the "Structural Fill" paragraph. Design considerations are discussed in the following sections.

Groundwater was encountered in both of the test borings at depths ranging from 10 to 10.5 feet. It is anticipated groundwater will not affect the construction of shallow foundations with slab on grade floors on this site. Unstable conditions should be expected where excavations approach the groundwater level. Stabilization using geo-grids or shot rock may be necessary. Development of this and adjacent properties, as well as seasonal precipitation changes, and changes in runoff may affect groundwater elevations.

This has been a unseasonable dry year. ground water levels at 10 feet may inter fer with the underground mechanic bays? Identify the hazard on the plat (use hatch mark(s) for areas of concern).

5.1 Subgrade Improvements and Bearing Capacity

The structures can be supported with shallow foundations resting on the medium dense to dense native sands, recompacted loose sands, approved sand fill, or structural fill. Observations should be made by Entech on the open excavation to evaluate the subgrade for loose soils, uncontrolled fill, or expansive clay soils. Loose sands or uncontrolled fills encountered beneath foundation components and floor slabs, will require removal and recompaction to depths of 2 to 3 feet below grade or complete removal/replacement, respectively. Any recompacted sand or new fill should be placed to the requirements of the "Structural Fill" paragraph. On-site granular sands may be used as structural fill as approved by Entech. Any import material should be approved by Entech prior to hauling to the site.

Provided the above recommendations are followed, an allowable bearing pressure of 2000 psf is recommended for structural fill, native medium dense sands 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 4 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 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 45 pcf is recommended for the granular site soils and is anticipated for imported granular structural fills. It should be noted that these values apply to level backfill conditions. If 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 provided the uncontrolled fill and loose soils are mitigated as described above.

5.3 On-Grade Floor Slabs

The floor slabs may be supported on structural fill, native sands or recompacted loose sands. Slabs placed on loose soils should be expected to experience movement. In areas of truck traffic, consideration should be given to placing at least 3 feet of onsite granular fill below floor slabs to reduce slab movement. Uncontrolled fills of any depth and clay soils encountered at or within 4 feet of floor slab grade should be removed and replaced with a non-expansive on-site or imported structural fill. The depth of overexcavation should be determined at the time of the excavation observation. On-site or imported granular soils, as approved by Entech, may be used as structural fill. Structural fill should be compacted to a minimum of 95 percent of its maximum Modified Proctor Dry Density (ASTM D-1557). The fill should be moisture conditioned to ±2 percent of the optimum moisture content as determined to aid in compaction. All soil

beneath the slab should be free of organics, debris and stone sized larger than 3 inches in diameter.

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 Engineering 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 granular soil 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 Engineering, Inc. Imported soils should be approved by Entech Engineering, Inc. 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 specifications of El Paso County or other appropriate authority. 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 avoid 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 by Hammers Construction with application to the planned retail/service building to be located at 6985 Meridian Road, in Falcon, 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.

TABLES

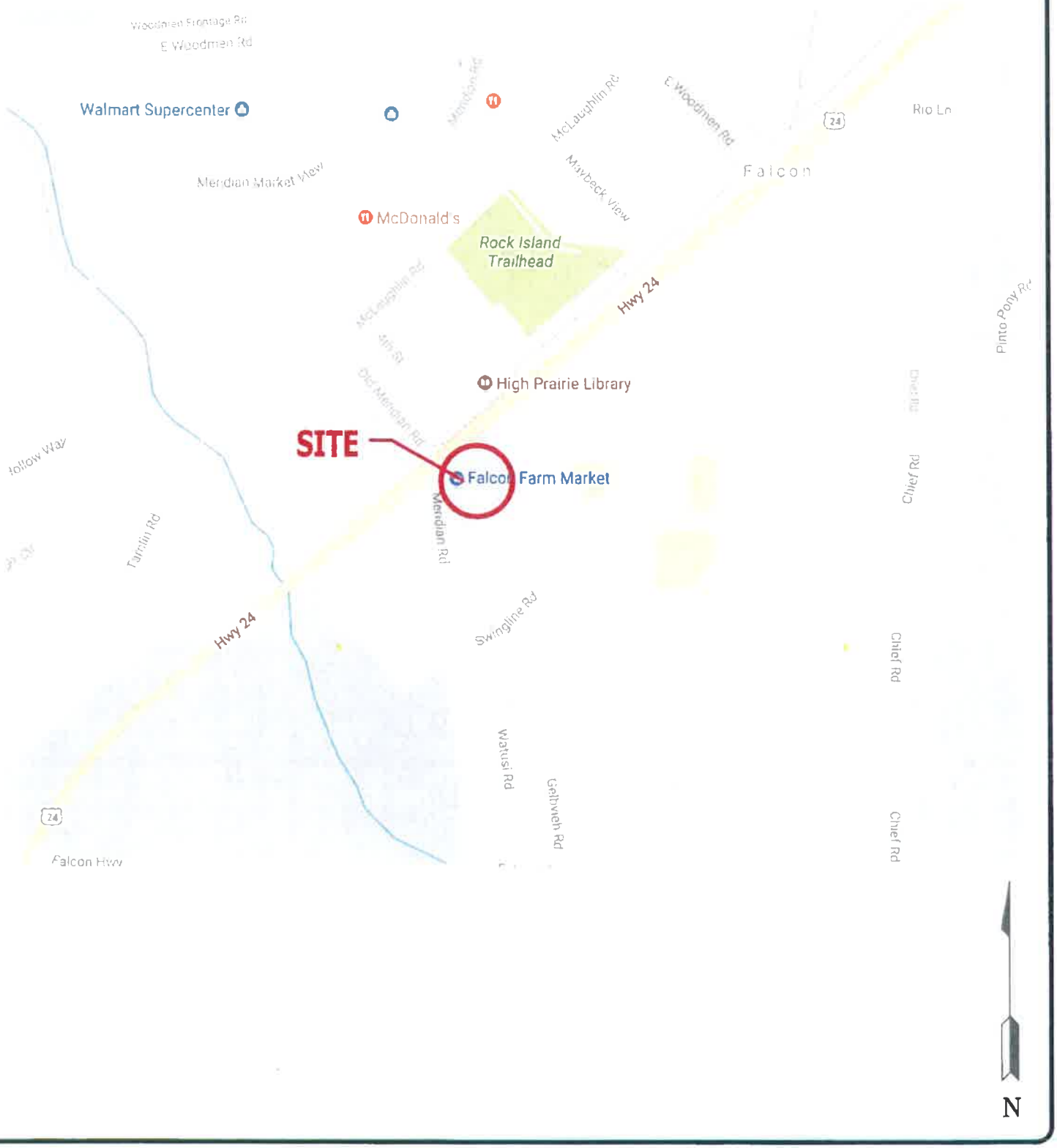
TABLE 1

SUMMARY OF LABORATORY TEST RESULTS

CLIENT HAMMERS CONSTRUCTION
PROJECT 6985 MERIDIAN ROAD
JOB NO. 171206

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	5			12.3	NV	NP	<0.01			SM	SAND, SILTY
1	2	5			6.2						SM-SW	SAND, SLIGHTLY SILTY
1	2	15			12.8						SM	SAND, SILTY
2	1	20			18.7						SM	SANDSTONE, SILTY
1	2	20			18.2	24	2	<0.01			SM	SAND, SILTY

FIGURES

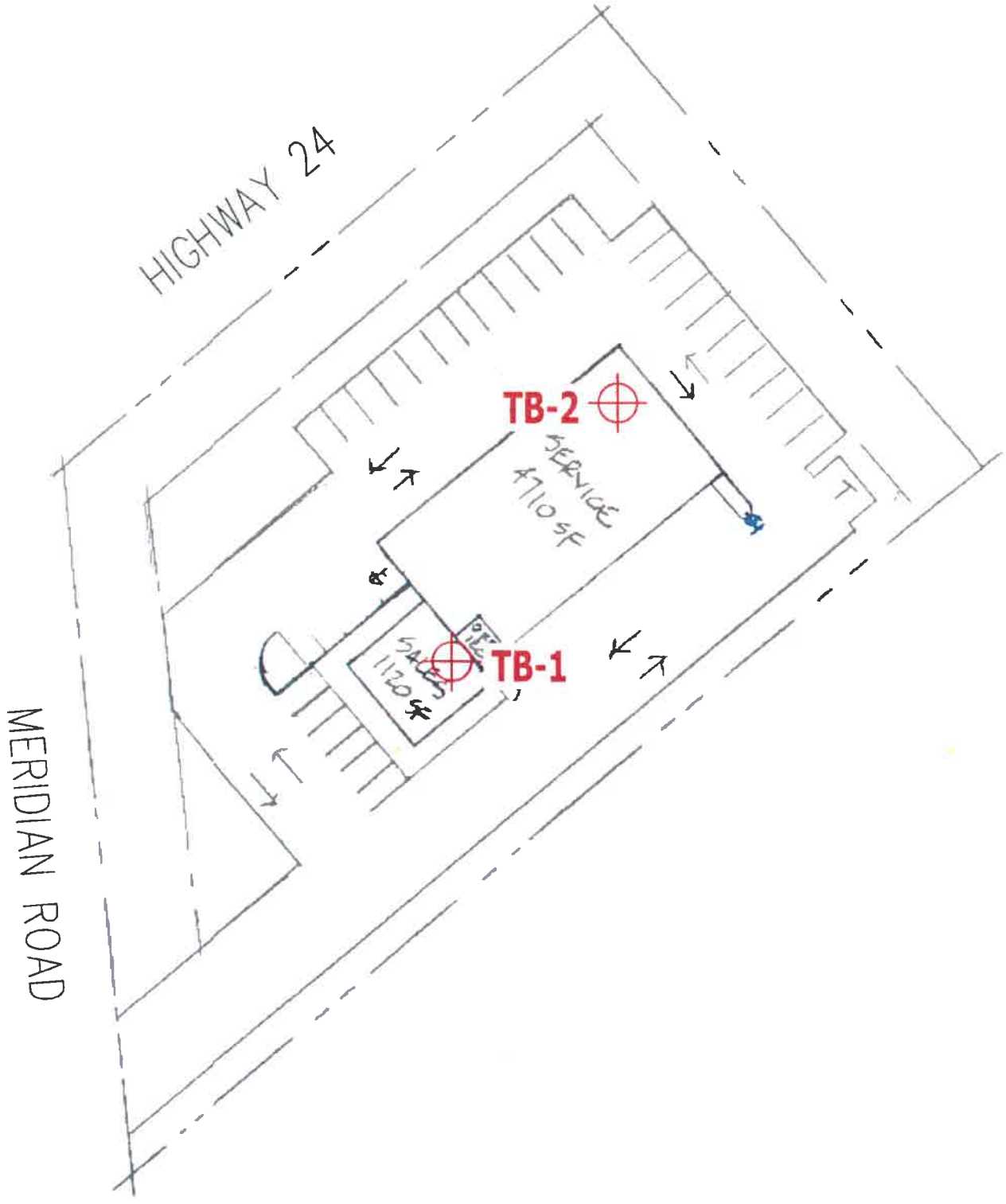


ENTECH ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

VICINITY LOCATION MAP
6985 MERIDIAN ROAD
FALCON, CO
FOR: HAMMERS CONSTRUCTION

DRAWN BY:	DATE DRAWN:	DESIGNED BY:	CHECKED:
BWV	09/29/17	DS	

JOB NO.: 171206
FIG. NO.: 1



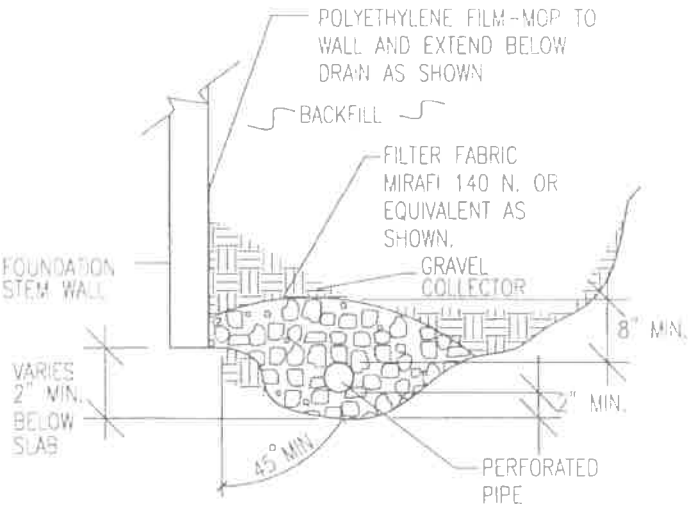
TB-2- APPROXIMATE TEST BORING LOCATION AND NUMBER

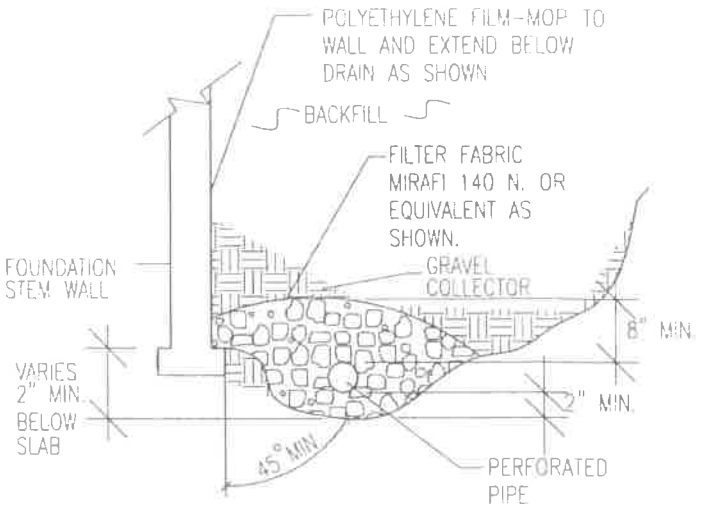
ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

TEST BORING LOCATION MAP
6985 MERIDIAN ROAD
FALCON, CO
FOR: HAMMERS CONSTRUCTION

DRAWN BY:	DATE DRAWN:	DESIGNED BY:	CHECKED:
BWV	09/07/17	DS	

JOB NO.: 171206
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.

ENTECH
ENGINEERING, INC.
505 ELKTON DRIVE
COLORADO SPRINGS, CO. 80907 (719) 531-5599

PERIMETER DRAIN DETAIL

DRAWN:	DATE DRAWN:	DESIGNED BY:	CHECKED:
		DS	BV

JOB NO.: 171206

FIG. NO.: 3

APPENDIX A: Test Boring Logs

TEST BORING NO. 1
DATE DRILLED 9/14/2017
Job # 171206

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
WATER @ 10', 9/14/17 CAVED TO 6', 9/26/17, DRY						
FILL 0-3', SAND, SILTY, FINE TO COARSE GRAINED, BROWN, LOOSE, MOIST				6	8.1	1A
SAND, SILTY, FINE TO COARSE GRAINED, BROWN, VERY LOOSE, MOIST	5			3	8.0	1
SAND, SILTY, FINE TO COARSE GRAINED, TAN, MEDIUM DENSE, VERY MOIST TO WET ▼	10			21	7.6	1
	15			18	9.6	1
SANDSTONE, SILTY, FINE TO COARSE GRAINED, GRAY BROWN, VERY DENSE, MOIST	20			50/9"	9.8	2

TEST BORING NO. 2
DATE DRILLED 9/14/2017
CLIENT HAMMERS CONSTRUCTION
LOCATION 6985 MERIDIAN ROAD

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
WATER @ 10.5', 9/26/17						
SAND, SLIGHTLY SILTY, FINE GRAINED, TAN, LOOSE MOIST				8	2.2	1
	5			6	2.4	1
SAND, SILTY, FINE TO COARSE GRAINED, TAN TO GRAY, MEDIUM DENSE TO DENSE, VERY MOIST TO WET ▼	10			12	5.0	1
	15			30	9.9	1
	20			25	14.8	1

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

TEST BORING LOG

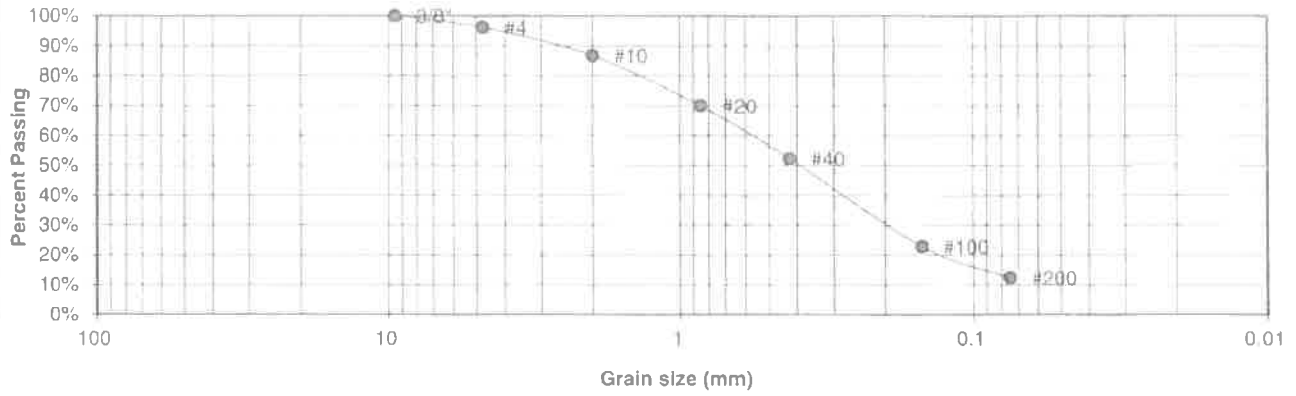
DRAWN:	DATE:	CHECKED:	DATE:
			10/17/17

JOB NO.: 171206
FIG NO.: A- 1

APPENDIX B: Laboratory Test Results

UNIFIED CLASSIFICATION	SM	CLIENT	HAMMERS CONSTRUCTION
SOIL TYPE #	1	PROJECT	6985 MERIDIAN ROAD
TEST BORING #	1	JOB NO.	171206
DEPTH (FT)	5	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	96.2%
10	86.7%
20	69.9%
40	52.3%
100	22.8%
200	12.3%

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)	

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

LABORATORY TEST RESULTS

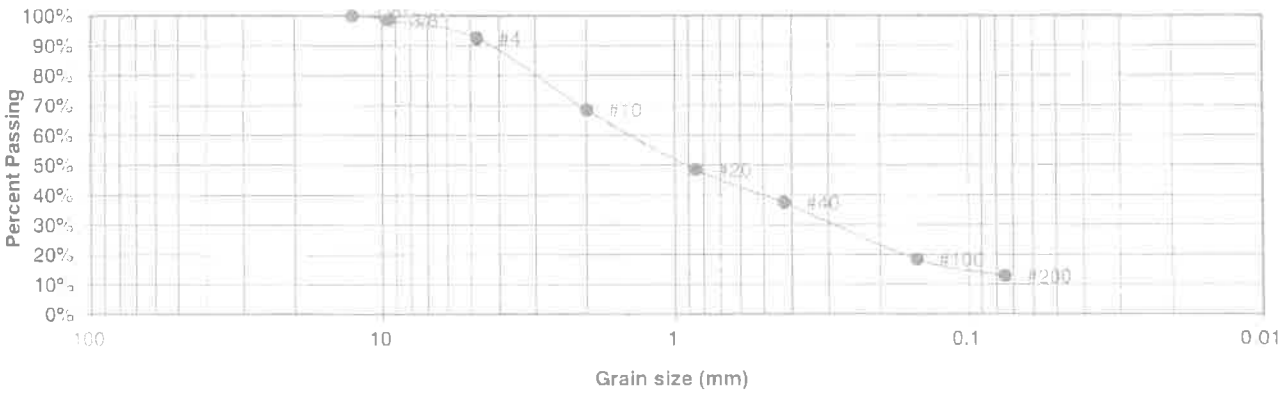
DRAWN:	DATE:	CHECKED: BV	DATE: 9/24/17

JOB NO 171206

FIG NO B-1

UNIFIED CLASSIFICATION	SM	CLIENT	HAMMERS CONSTRUCTION
SOIL TYPE #	1	PROJECT	6985 MERIDIAN ROAD
TEST BORING #	2	JOB NO.	171206
DEPTH (FT)	15	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	100.0%
3/8"	98.7%
4	92.5%
10	68.5%
20	48.4%
40	37.3%
100	18.4%
200	12.8%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

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

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

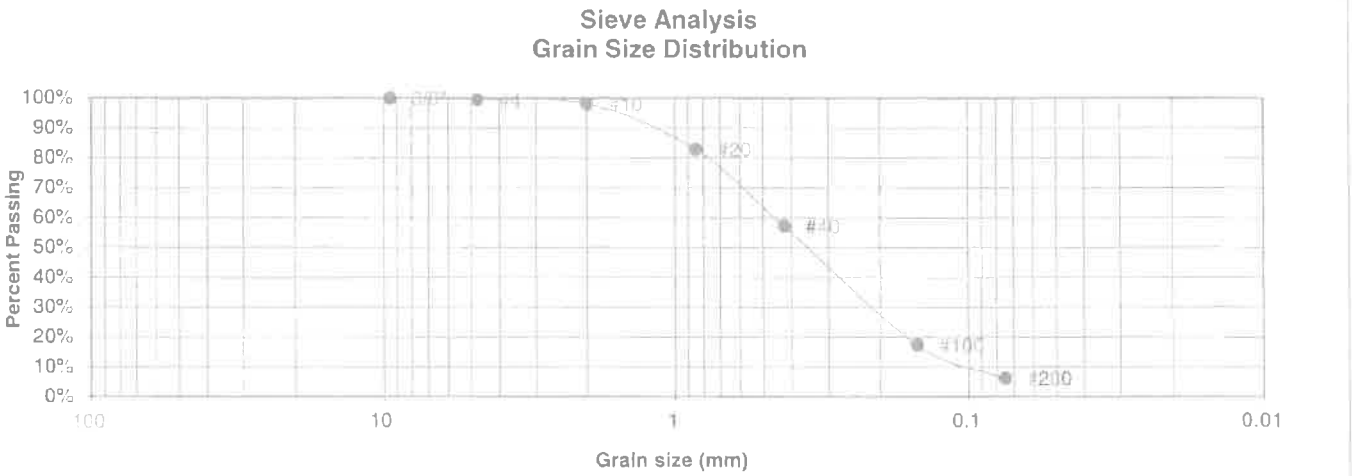
LABORATORY TEST RESULTS

DRAWN	DATE:	CHECKED:	DATE:
		BV	9/29/17

JOB NO 171206

FIG NO B-2

UNIFIED CLASSIFICATION	SM-SW	CLIENT	HAMMERS CONSTRUCTION
SOIL TYPE #	1	PROJECT	6985 MERIDIAN ROAD
TEST BORING #	2	JOB NO.	171206
DEPTH (FT)	5	TEST BY	BL



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.4%
10	98.1%
20	82.9%
40	57.1%
100	17.3%
200	6.2%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

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

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

LABORATORY TEST RESULTS

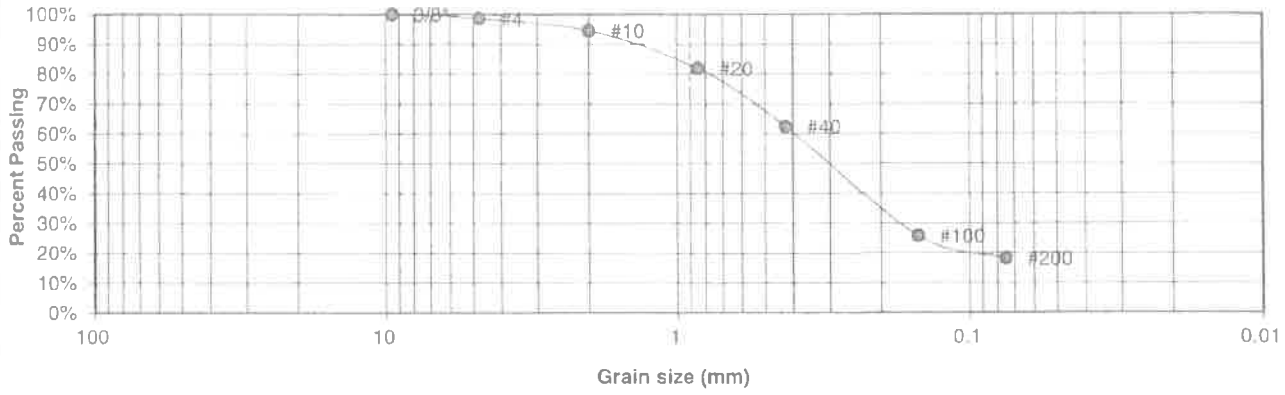
DRAWN:	DATE:	CHECKED:	DATE
		BV	9/29/17

JOB NO 171206

FIG NO B-3

UNIFIED CLASSIFICATION	SM	CLIENT	HAMMERS CONSTRUCTION
SOIL TYPE #	1	PROJECT	6985 MERIDIAN ROAD
TEST BORING #	2	JOB NO.	171206
DEPTH (FT)	20	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	98.6%
10	94.6%
20	81.9%
40	62.5%
100	25.8%
200	18.2%

Atterberg Limits	
Plastic Limit	22
Liquid Limit	24
Plastic Index	2

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

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

LABORATORY TEST RESULTS

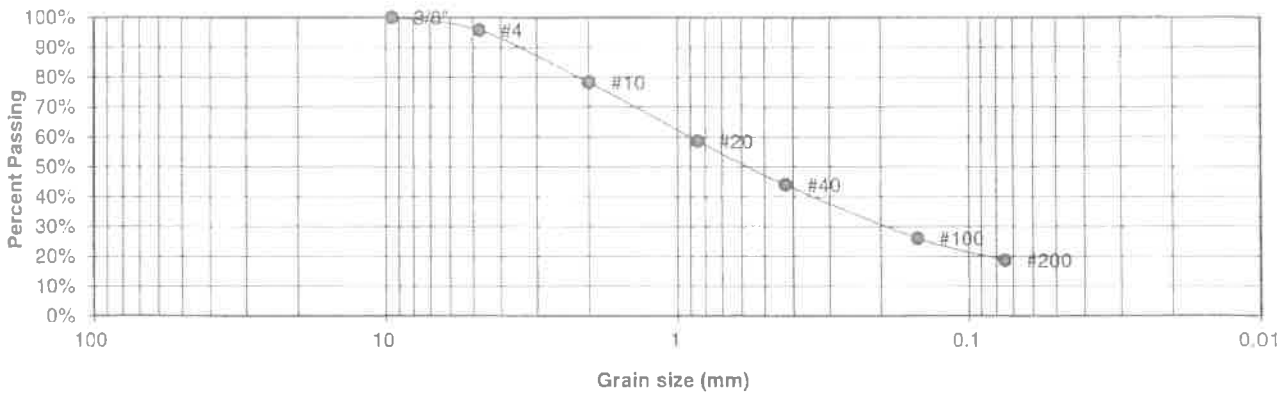
DRAWN	DATE:	CHECKED:	DATE:
			10/17/17

JOB NO.: 171206

FIG NO.: B-4

UNIFIED CLASSIFICATION	SM	CLIENT	HAMMERS CONSTRUCTION
SOIL TYPE #	2	PROJECT	6985 MERIDIAN ROAD
TEST BORING #	1	JOB NO.	171206
DEPTH (FT)	20	TEST BY	BL

Sieve Analysis
Grain Size Distribution



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	95.8%
10	78.3%
20	58.6%
40	44.0%
100	26.1%
200	18.7%

Atterberg Limits
Plastic Limit
Liquid Limit
Plastic Index

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

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

LABORATORY TEST RESULTS

DRAWN:	DATE:	CHECKED	DATE
			10/17/17

JOB NO.: 171206

FIG NO.: B-5

CLIENT	HAMMERS CONSTRUCTION	JOB NO.	171206
PROJECT	6985 MERIDIAN ROAD	DATE	9/25/2017
LOCATION	6985 MERIDIAN ROAD	TEST BY	BL

BORING NUMBER	DEPTH, (ft)	SOIL TYPE NUMBER	UNIFIED CLASSIFICATION	WATER SOLUBLE SULFATE, (wt%)
TB-1	5	1	SM	<0.01
TB-2	20	1	SM	<0.01

QC BLANK PASS

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

LABORATORY TEST
SULFATE RESULTS

DRAWN:	DATE:	CHECKED:	DATE:
		LA	10/17/17

JOB NO.: 171206

FIG NO.: B-6

Markup Summary

dsdlaforce (2)

Subject: Text Box
Page Label: 1
Lock: Unlocked
Status:
Checkmark: Unchecked
Author: dsdlaforce
Date: 2/20/2018 1:31:58 PM
Color:

Add "PCD File No. SF-18-003"

Subject: Callout
Page Label: 6
Lock: Unlocked
Status:
Checkmark: Unchecked
Author: dsdlaforce
Date: 2/20/2018 1:34:14 PM
Color:

Provide evaluation/recommendation for the foundation preparation and embankment construction for the permanent detention facility.

dsdparsons (4)

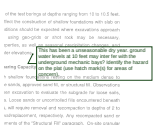
Subject: Callout
Page Label: 1
Lock: Unlocked
Status:
Checkmark: Unchecked
Author: dsdparsons
Date: 2/20/2018 4:19:09 PM
Color:

This is a site dev plan report not a subdivision report. Please see the Code, Section 8.4.9. for requirements. There are hazards (constraints) that need to be identified on the plat (No preliminary plan was completed previously). The natural features report indicates 4 soil types and a constraint to be removed.

Subject: Callout
Page Label: 4
Lock: Unlocked
Status:
Checkmark: Unchecked
Author: dsdparsons
Date: 2/20/2018 4:18:31 PM
Color:

This is for the creation of a lot. 3 soils were identified in the building pad area. A boring is required for each soil type within the proposed subdivision (outside of building area) See Section 8.4.9 NOTE:
4 soil types are noted in the natural feature s report for the proposed lot. An abandoned but not removed septic system is also noted.

Subject: Callout
Page Label: 7
Lock: Unlocked
Status:
Checkmark: Unchecked
Author: dsdparsons
Date: 2/20/2018 4:04:17 PM
Color:



Subject: Callout
Page Label: 7
Lock: Unlocked
Status:
Checkmark: Unchecked
Author: dsdparsons
Date: 2/20/2018 4:06:07 PM
Color:

This has been a unseasonable dry year. ground water levels at 10 feet may inter fer with the underground mechanic bays? Identify the hazard on the plat (use hatch mark(s) for areas of concern).