

ON 00 36,190

APN 7136002061

8/29/2016



**ENTECH**  
ENGINEERING, INC.

505 ELKTON DRIVE  
COLORADO SPRINGS, CO 80907  
PHONE (719) 531-5589  
FAX (719) 531-5238

August 19, 2016

Broders Excavation  
557 Rose Drive  
Colorado Springs, Colorado 80911

Attn: Richard Broders

Re: Test Pit Observation – OWTS Repair  
715 Struthers Loop  
El Paso County, Colorado

Dear Mr. Broders:

As requested, personnel of Entech Engineering, Inc. have observed the excavation of three test pits at the above referenced site. This letter presents the results of our testing.

The following recommendations are based on conditions observed on August 16, 2016. Entech Engineering, Inc. should be notified if any changes in conditions are encountered or if the proposed absorption field location should change. A Test Pit Location Map is included as Figure 1.

Soil types observed in the test pit excavations were found to consist of sand, sandy clay loam and clay overlying weathered to formational sandstone. Grain size analysis of the upper sand soils resulted in 4 to 21 percent of the soil particles passing the No. 200 sieve. Weathered to formational sandstone bedrock was encountered at approximately 4 to 5 feet in Test Pit Nos. 1 and 2, which were excavated to depths 5 to 8 feet. Bedrock was not encountered in Test Pit No. 3, which was excavated to 8 feet. Signs of seasonal groundwater were observed at depths of approximately 4 to 5 feet in Test Pit Nos. 1 and 2, and at approximately 7 feet in Test Pit No. 3. Test Pit logs are presented in Figures 2 and 3.

Based on the soils observed the area of Test Pit No. 3 has been chosen for the new OWTS field location. A LTAR Value of 0.60, for Treatment Level 1 is recommended for the design of the field repair. The field should be sized based on the number of bedrooms and anticipated usage. If gravity flow is not possible, a pump and pumping chamber will be required. A minimal separation of 4 feet is required between the absorption field and the groundwater or bedrock.

The absorption field should be installed in accordance with El Paso County Health Department regulations.

Broders Excavation  
Test Pit Observation – OWTS Repair  
715 Struthers Loop  
El Paso County, Colorado  
Page Two

We trust this has provided you with the information you required. If you have any questions or need additional information, please do not hesitate to contact us.

Respectfully Submitted,

ENTECH ENGINEERING, INC.



Logan L. Langford  
Geologist

LLL/crf

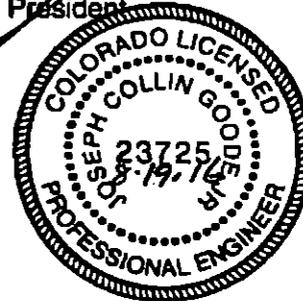
Encl.

Entech Job No. 161641  
AAproject/2018/161641 tpo

Reviewed by:



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





**TP- APPROXIMATE TEST PIT LOCATION AND NUMBER**



**BM- APPROXIMATE BENCHMARK LOCATION 39°3'2.51"N, 104°50'40.42"W**  
**- 270' N X 180' W OF BM**



**ENTECH**  
**ENGINEERING, INC.**  
200 BLATTEN DRIVE  
 COLORADO SPRINGS, CO. 80907 719 531-8339

**Site Plan/Test Pit Location Map**  
**715 Struthers Loop**  
**El Paso County, CO.**  
**For: Broders Excavation**

**DRAWN:**  
**LLL**

**DATE:**  
**8/19/16**

**CHECKED:**

**DATE:**

**JOB NO.:**  
**161641**

**FIG NO.:**  
**1**

TEST PIT NO. 1  
 DATE EXCAVATED 8/16/2016  
 Job # 161641

TEST PIT NO. 2  
 DATE EXCAVATED 8/16/2016  
 CLIENT BRODERS EXCAVATION  
 LOCATION 715 STRUTHERS LOOP

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
topsoil - sandy loam, fine to coarse grained, dark brown	1	[Symbol]					topsoil - sandy loam, fine to coarse grained, dark brown	1	[Symbol]				
sand, fine to coarse grained with gravel, tan	2	[Symbol]					sand, fine to coarse grained with gravel, tan	2	[Symbol]				
	3	[Symbol]						3	[Symbol]				
sandy clay loam, fine to coarse grained, grayish tan	4	[Symbol]						4	[Symbol]				
	5	[Symbol]					sandstone, fine to coarse grained, tan	5	[Symbol]				
sandstone, very silty, fine grained, tan	6	[Symbol]						6	[Symbol]				
	7	[Symbol]						7	[Symbol]				
sandstone, fine to coarse grained, tan	8	[Symbol]						8	[Symbol]				
	9	[Symbol]						9	[Symbol]				
	10	[Symbol]						10	[Symbol]				



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

**TEST PIT LOG**

DRAWN:	DATE:	CHECKED: LLL	DATE: 8/19/16
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JOB NO:  
161641  
 PLO NO:  
2

TEST PIT NO. 3  
 DATE EXCAVATED 8/16/2016  
 Job # 161641

TEST PIT NO. 4  
 DATE EXCAVATED 8/16/2016  
 CLIENT BRODERS EXCAVATION  
 LOCATION 715 STRUTHERS LOOP

REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type	REMARKS	Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %	Soil Type
topsoil - sandy loam, fine to coarse grained, dark brown	1	KK						1					
sand, fine to coarse grained, tan	2							2					
	3							3					
	4							4					
	5							5					
	6							6					
	7							7					
clay, reddish gray	8							8					
	9							9					
	10							10					



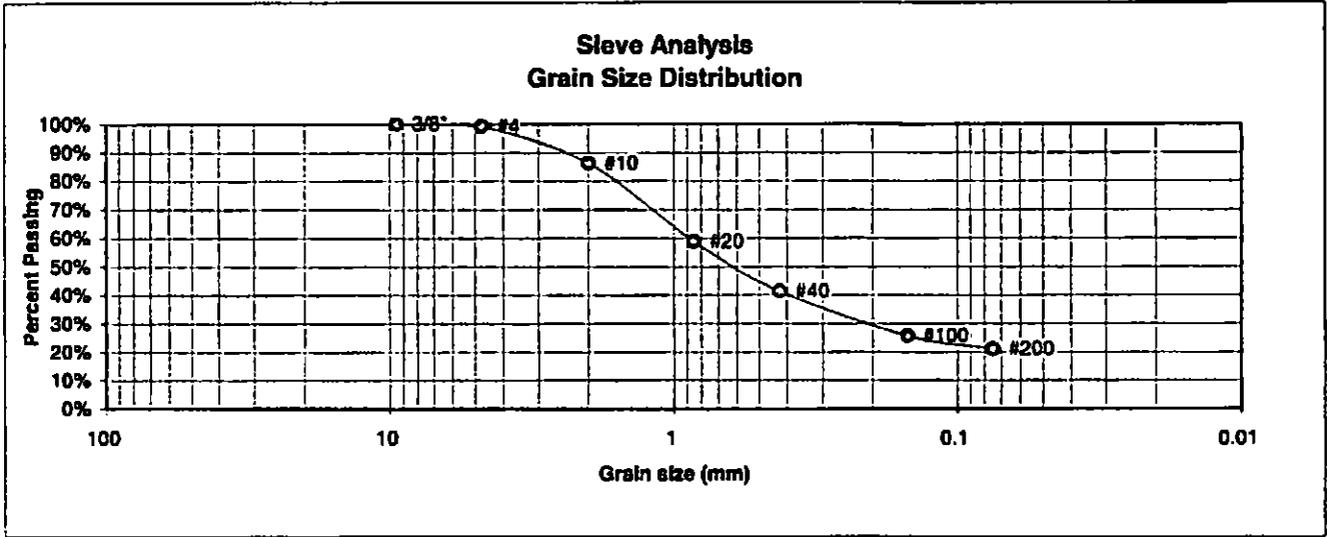
**ENTECH**  
**ENGINEERING, INC.**  
 505 ELKTON DRIVE  
 COLORADO SPRINGS, COLORADO 80907

**TEST PIT LOG**

DRAWN:	DATE:	CHECKED: LLL	DATE: 8/19/16
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JOB NO:  
161641  
 FIG NO:  
3

BORING NO.	TP-1	<u>UNIFIED CLASSIFICATION</u>	SM	<u>TEST BY</u>	BL
DEPTH(ft)	4.5-5'	<u>AASHTO CLASSIFICATION</u>		<u>JOB NO.</u>	161641
CLIENT	BRODERS EXCAVATING				
PROJECT	715 STRUTHERS LOOP				



U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	100.0%
4	99.2%
10	86.1%
20	58.8%
40	41.3%
100	25.7%
200	21.0%

Atterberg Limits	
Plastic Limit	18
Liquid Limit	19
Plastic Index	1

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



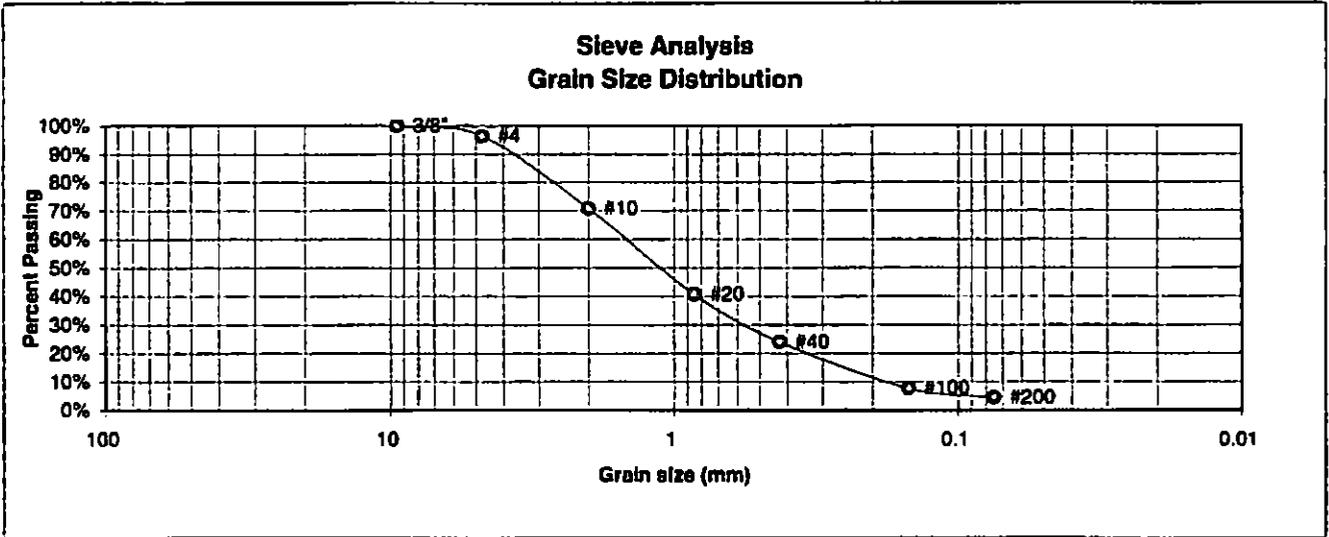
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ENGINEERING, INC.  
505 ELKTON DRIVE  
COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST RESULTS**

DRAWN:	DATE:	CHECKED: LL	DATE: 8/19/16
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JOB NO.:  
161641  
FIG NO.:  
4

BORING NO.	TP-3	<u>UNIFIED CLASSIFICATION</u>	SW	<u>TEST BY</u>	BL
DEPTH(ft)	1.5-7'	<u>AASHTO CLASSIFICATION</u>		<u>JOB NO.</u>	161641
CLIENT	BRODERS EXCAVATING				
PROJECT	715 STRUTHERS LOOP				



<u>U.S. Sieve #</u>	<u>Percent Finer</u>	<u>Atterberg Limits</u>
3"		Plastic Limit
1 1/2"		Liquid Limit
3/4"		Plastic Index
1/2"		
3/8"	100.0%	
4	96.4%	<u>Swell</u>
10	70.8%	Moisture at start
20	40.7%	Moisture at finish
40	23.9%	Moisture increase
100	7.7%	Initial dry density (pcf)
200	4.4%	Swell (psf)



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503 ELKTON DRIVE  
COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST RESULTS**

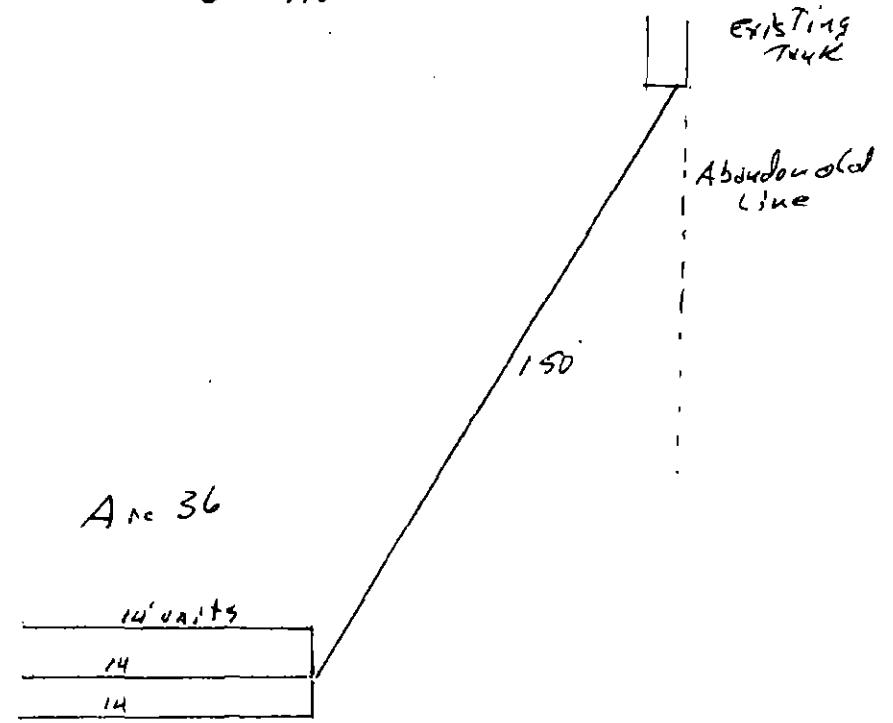
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		LLL	8/19/16

JOB NO:  
161641  
FIG NO:  
5

8-22-16  
Broderick Excavating

715 STANTHEM LOOP  
0N0036190  
APN# 7136002061

Well  
○ NORTH



Approved design document  
8-23-16 Janet

1" = 40'



Prevent • Promote • Protect

Environmental Health Division

1675 W. Garden of the Gods Rd., Suite 2044  
Colorado Springs, CO 80907  
(719) 578-3199 phone  
(719) 575-3188 fax  
www.elpasocountyhealth.org

**CONVENTIONAL (NON-ENGINEERED)  
ON-SITE WASTEWATER TREATMENT SYSTEM (OWTS) DESIGN WORKSHEET  
(MUST BE COMPLETED FOR ALL CONVENTIONAL DESIGNS)**

**Wastewater Flow**

Total number of bedrooms:	<u>4</u>
Design wastewater flow (gallons/day) from Table 6-1:	<u>✓ 525</u>

**Septic Tank**

Septic tank size (in gallons) from Table 9-1:	<u>1500</u>	<u>1250</u>
Tank burial depth (from top of tank, in inches) <i>(NOTE: Shall not exceed 48 inch depth by regulation)</i>	<u>36"</u>	
Will groundwater affect tank?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Will an effluent screen be installed?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

*(Note: Effluent screens are required for all new systems or replacement of the septic tank)*

**Soil Treatment Area (STA)**

Long Term Acceptance Rate (LTAR) From Table 10-1:	<u>.50</u>
Unadjusted STA size (see 8.10.C.4) – show calculation:	<u>875</u>
<u>Design flow (gallons per day)</u>	<u>.7</u>
<u>LTAR (gallons/day/sq.ft.)</u> =	<u>61250 368 ft</u>
Depth of STA (cannot exceed 48"):	
_____ Trenches are preferred. If bed system is selected, the selection reason must be specified: _____	
Type of STA (check which applies): <input checked="" type="checkbox"/> Trench <input type="checkbox"/> Bed	FOR REPAIRS ONLY (check which applies): <input type="checkbox"/> Wide Bed (more than 12 feet wide) <input type="checkbox"/> Deep Gravel Trenches <input type="checkbox"/> Seepage Pit <input type="checkbox"/> None of the Above

**Method of Septic Tank Effluent Application (check which applies):**

- Gravity
- Pump to gravity
- Dispersed by siphon

**Type of Distribution Media (check which applies):**

- Rock
- Tire chips
- Chambers
- Other \_\_\_\_\_ Other type \_\_\_\_\_

Adjusted STA size, using factors from Table 10-2 & 10-3 (show calculation, with adjustment factors utilized):

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A scale drawing shall be provided with each design document (see attached example design documents), showing:

- Layout of entire OWTS, including the STA configuration (trench, bed, etc.)
- Dimensions of the trench(s) or the bed(s)
- Location of all OWTS components and distances to all applicable physical features in Table 7-1
- Depths of all components (or elevations relative to a designated benchmark)
- Location of the soil profile test pit excavation(s), or percolation test holes, if required
- Location of the alternate STA site
- North direction arrow
- Graphic scale (1"= 20', 1"= 30', etc.)
- Contours, OR slope direction and % slope

**Note: It is recommended that the design document is completed by a professional in the OWTS industry. EPCPH does not complete, or alter design documents. Contact EPCPH with any questions.**

The proposed STA sites must be protected from disturbance, compaction, or other damage by staking, fencing, posting or other effective methods.

**Certification**



Signature

Richard Broders

Print Name

8-9-16

Date

715 S Truthena Loop

Property Address

Broders Excavating

Company Name

557 Rose Dr

Address

719-338-4630

Phone

2.broders@co.com

Email

(See attached Tables and Design Document examples)