

May 5, 2020



**ENTECH**  
ENGINEERING, INC.

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

Mule Creek Gravel  
1050 County Road 231  
Woodland Park, CO 80863

Attn: Ryan Middleton

Re: Laboratory Testing – Classification Testing and California Bearing Ratio Testing  
21094 Highway 67  
Divide, Colorado

Dear Mr. Middleton:

As requested, personnel of Entech Engineering, Inc. performed sieve testing and a California Bearing Ratio Test on a Class 6 sample delivered to our lab.

The laboratory sieve test results are attached to this report in Figure No.1. The California Bearing Ratio and the associated testing are attached in Figures 2 through 4.

We trust that 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.

Daniel P. Stegman



Reviewed by:

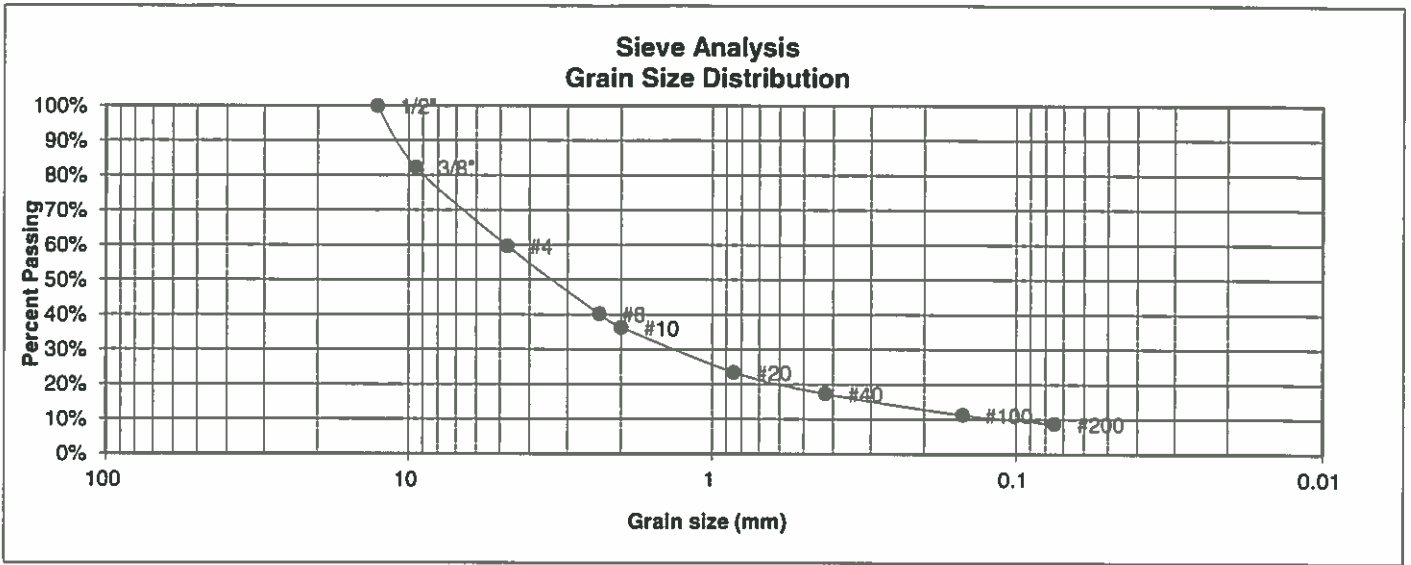
*M. Hauschild*  
Mark H. Hauschild, P.E.  
Senior Engineer

DPS/ts

Encl.

Entech Job No. 190854  
AAprojects/2019/190854 cbr 3

SOIL TYPE #	I	UNIFIED CLASSIFICATION	SM-SW	TEST BY	BL
CLIENT	MULE CREEK GRAVEL, LLC	AASHTO CLASSIFICATION		JOB NO.	190854
PROJECT	21094 HIGHWAY 67			DATE	4/30/20



U.S. Sieve #	Percent Finer	CLASS 2	CLASS 5	CLASS 6
3"		<u>Base Aggregates</u>		
1 1/2"		95-100		
1"			100	
3/4"			95-100	
1/2"	100.0%			100
3/8"	82.3%			
4	59.7%		30-70	30-65
8	40.2%			25-55
10	36.3%			
20	23.4%			
40	17.3%			
100	11.3%			
200	8.8%	3-15	3-15	3-12

Atterberg Limits		FHA Swell		
Plastic Limit	NP			
Liquid Limit	NV	35 max	30 max	30 max
Plastic Index	NP	6 max	6 max	6 max
				Moisture at start
				Moisture at finish
				Moisture increase
				Initial dry density (pcf)
				Swell (psf)

**ENTECH ENGINEERING, INC.**  
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COLORADO SPRINGS, COLORADO 80907

**LABORATORY TEST RESULTS**

DRAWN:	DATE:	CHECKED:	DATE:
		DS	5/5/20

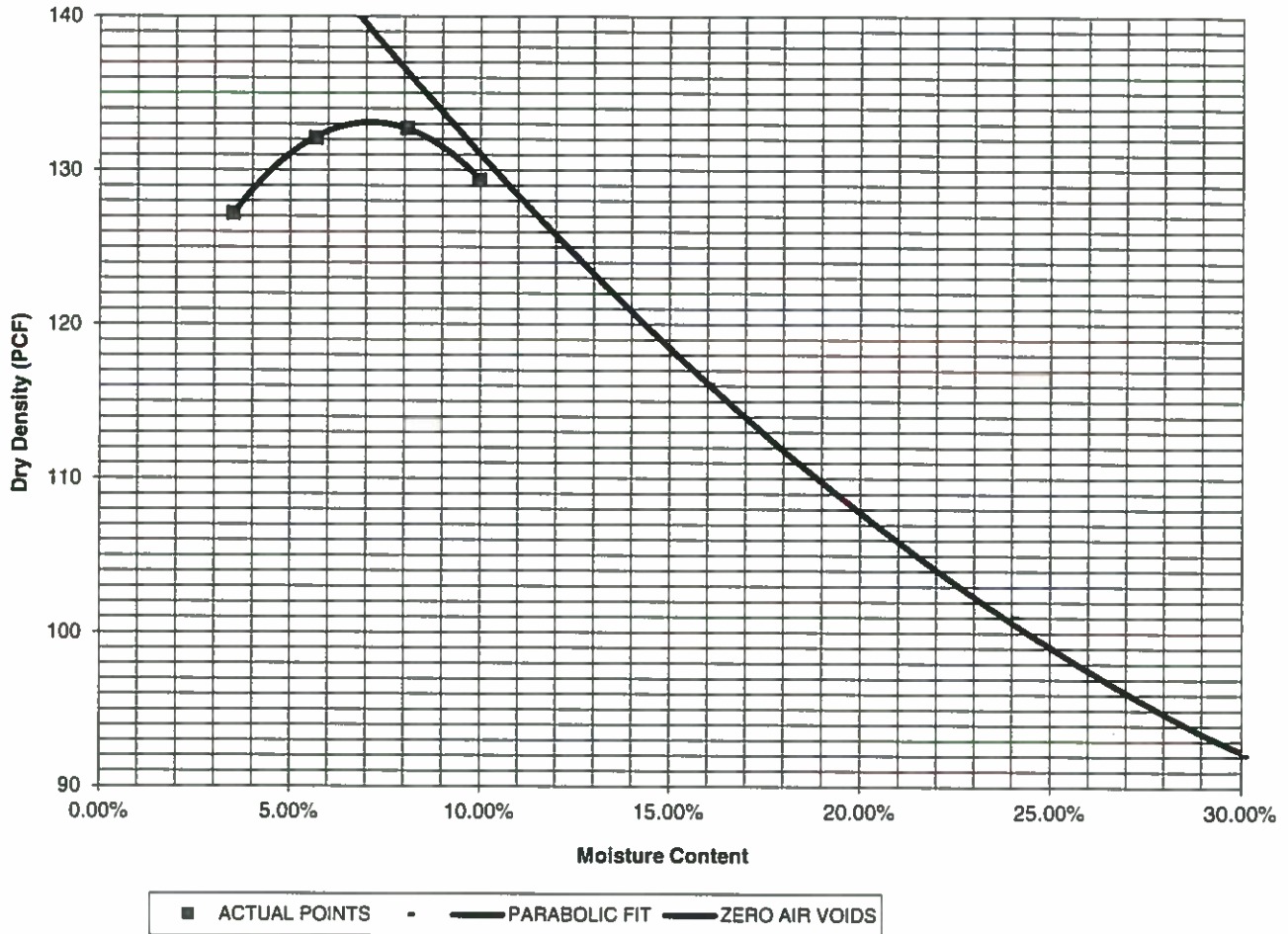
JOB NO.:  
190854

FIG NO.:  
1

<b>PROJECT</b>	21094 HIGHWAY 67	<b>CLIENT</b>	MULE CREEK GRAVEL, LLC
<b>SAMPLE LOCATION</b>	CLASS 6	<b>JOB NO.</b>	190854
<b>SOIL DESCRIPTION</b>	SAND, SL. SILTY, RED BROWN	<b>DATE</b>	04/30/20

<b>IDENTIFICATION</b>	SM-SW	<b>PROCTOR TEST #</b>	1
<b>TEST DESIGNATION / METHOD</b>	ASTM D-1557-B	<b>TEST BY</b>	BL
<b>MAXIMUM DRY DENSITY (PCF)</b>	133.1	<b>OPTIMUM MOISTURE</b>	7.2%

**Compaction Curve**



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**MOISTURE DENSITY RELATION**

DRAWN:

DATE:

CHECKED:

DATE:

DS

5/5/20

JOB NO.:

190854

FIG NO.:

2

**CBR TEST LOAD DATA**

JOB NO: 190854  
 CLIENT: MULE CREEK GRAVEL, LLC  
 PROJECT: 21094 HIGHWAY 67  
 SOIL TYPE: 1

PISTON		PISTON					
DIAMETER (cm)		AREA (in <sup>2</sup> )					
4.958		2.99250919					
PENETRATION DEPTH (INCHES)	10 BLOWS		25 BLOWS		56 BLOWS		
	MOLD # 1		MOLD # 2		MOLD # 3		
	LOAD(LBS)	STRESS (PSI)	LOAD(LBS)	STRESS (PSI)	LOAD(LBS)	STRESS (PSI)	
0.000	0	0.00	0	0.00	0	0.00	
0.025	96	32.08	235	78.53	462	154.39	
0.050	178	59.48	675	225.56	1232	411.69	
0.075	274	91.56	1054	352.21	1984	662.99	
0.100	379	126.65	1262	421.72	2185	730.16	
0.125	485	162.07	1455	486.21	2365	790.31	
0.150	689	230.24	1798	600.83	2748	918.29	
0.175	856	286.05	2033	679.36	3012	1006.51	
0.200	1136	379.61	2234	746.53	3321	1109.77	
0.300	1458	487.22	2678	894.90	4069	1359.73	
0.400	1756	586.80	2978	995.15	5263	1758.72	
0.500	2054	686.38	3326	1111.44	6000	2005.01	

**FINAL MOISTURE CONTENT**

	MOLD # 1	MOLD # 2	MOLD # 3
CAN #	101	102	109
WT. CAN	9.33	9.33	9.2
WT. CAN+WET	229.73	280.32	310.39
WT. CAN+DRY	203.6	253.4	284.95
WT. H2O	26.13	26.92	25.44
WT. DRY SOIL	194.27	244.07	275.75
MOISTURE CONTENT	13.45%	11.03%	9.23%

WET DENSITY (PCF)	124.8	134.2	141.9
DRY DENSITY (PCF)	116.4	125.2	132.4

BEARING RATIO                                    12.66                                    42.17                                    73.02

90% OF DRY DENSITY                            119.8  
 95% OF DRY DENSITY                            126.4

BEARING RATIO AT 90% OF MAX	23.98 - R VALUE	75
BEARING RATIO AT 95% OF MAX	47.52 - R VALUE	90



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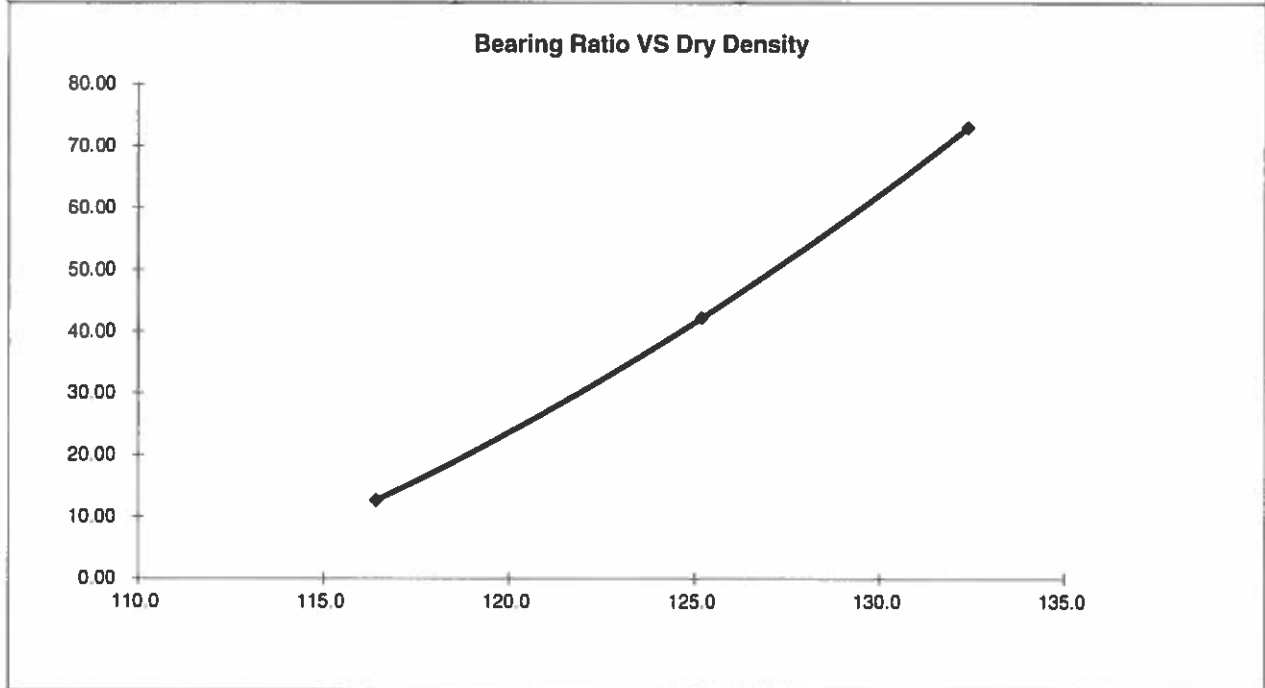
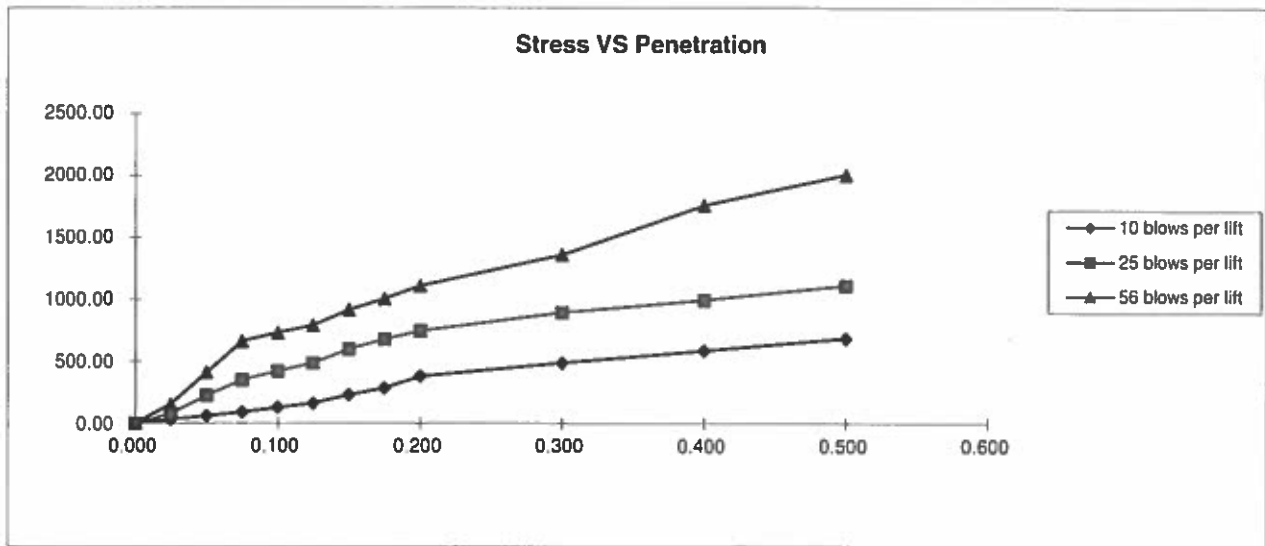
505 ELKTON DRIVE  
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**CBR TEST DATA**

DRAWN:	DATE:	CHECKED: DS	DATE: 5/5/20
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JOB NO:  
 190854

FIG NO:  
 3



BEARING RATIO AT 90% OF MAX	23.98 ~ R VALUE	75.00
BEARING RATIO AT 95% OF MAX	47.52 ~ R VALUE	90.00

JOB NO: 190854  
 SOIL TYPE: 1



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**CALIFORNIA BEARING RATIO**

DRAWN	DATE:	CHECKED: <i>B</i>	DATE: <i>5/15/12</i>
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JOB NO:  
 190854

FIG NO:  
*A*