

BRIDGER BIKE PARK  
QUESTIONS AND ANSWERS

April 23, 2019

Q1: Will imported soils be needed for this project?

A1: After May 22nd, when the full import of soils from Logan City is complete, approximately 2120 Cubic Yards of imported soils for general earthwork, and an additional 660 cubic yards is estimated for the trail surfacing material as indicated in plans.

Q2: What is the general makeup of soil on site?

A2: There is a bed of native soils, approximately 90% clay as native soils. The imported soils on site are a cobbly mix of 50/50 sand/silt mix. Photos of basic mason jar soil tests follow as Exhibits A and B.

Q3: What is the approximate makeup of the specified soil cap on the trail surfaces in the plan?

A3: Attached as Exhibits C and D, are reference documents which outline a suitable trail surfacing material soil sourced for the 9 line bike park in Salt Lake City, illustrating some acceptable variance in clay content. Final trail surfacing material choice must be verified and approved by project representative.

Q4: Are imported soils covered as a separate line item?

A4: Item 27 – Bid Alternate will be added to the Bid Schedule (See Addendum 2) to account for imported soils costs. All feature construction line items are inclusive of the elements, including trail surfacing material.

Q5: How strict are the boundaries on the trail surfacing material as illustrated in the plan?

A5: The plan represents a minimum amount of trail surfacing material, and a need for the final product to have clearly legible and delineated trails / jump lines. However, it does not represent a maximum amount of trail surfacing material.

Q6: How many cubic yards of soil are anticipated to complete the 90% grading plan?

A6: 2120 Cubic Yards of additional base material are anticipated. Some clay can be excavated from site, but due to a high water table - on site excavation should be approached with caution.

Q7: How many cubic yards of trail surface material are anticipated to surface the project as represented in the plans?

A7: Approximately 660 Cubic Yards of Trail Surfacing Material are anticipated to build the park as specified in the plans (Item 26 on Bid Schedule, Addendum 2).

April 29, 2019

Q8: Is there any testing of the soils being placed on this project?

A8: According to the construction notes on sheet GN01 of the construction documents, items 7a, 10a, 13a, and 13b describe soil characteristics that can be best verified through soils testing, despite the testing work not being listed as a requisite bid item.

END OF QUESTIONS

EXHIBIT A

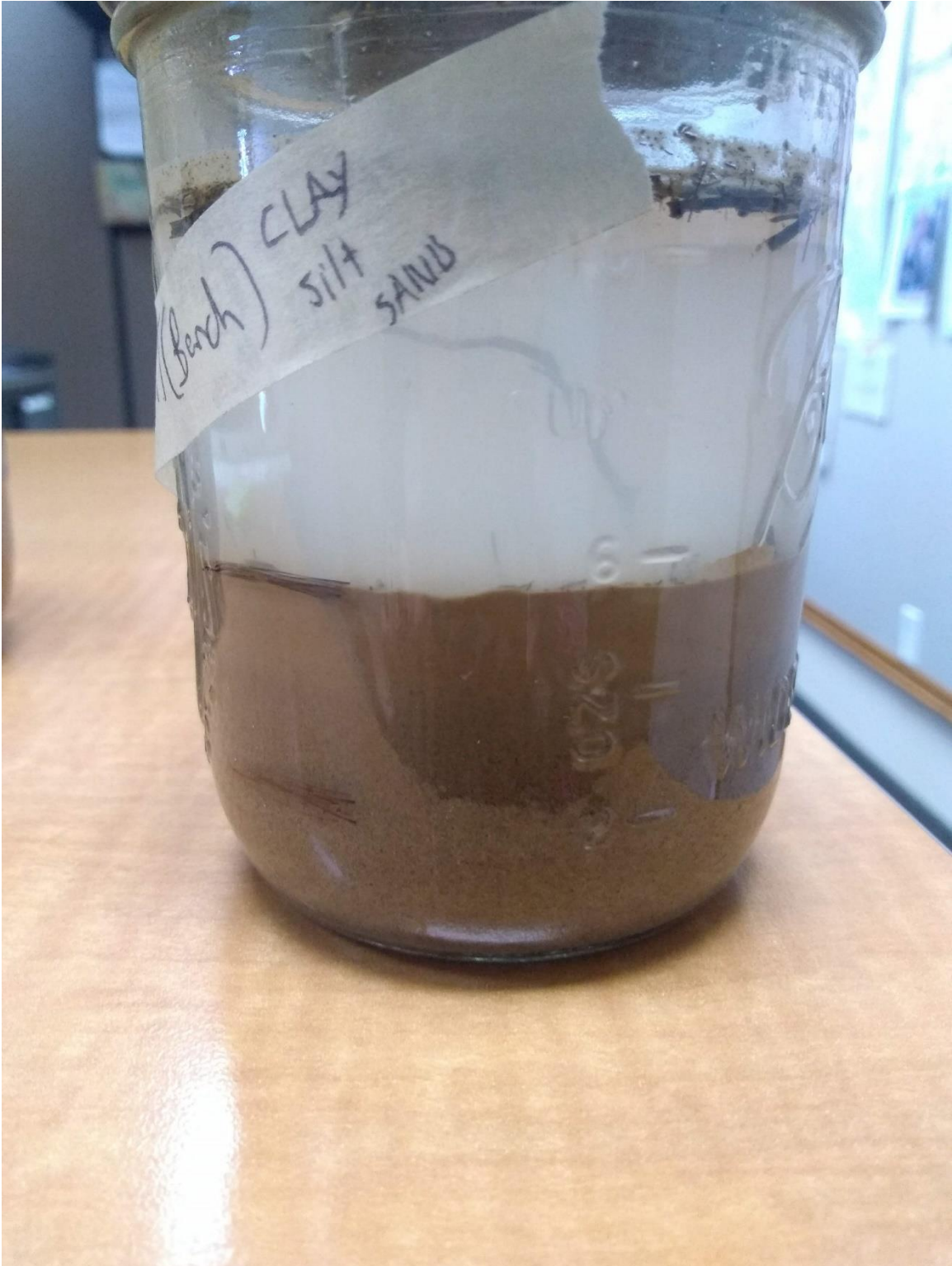
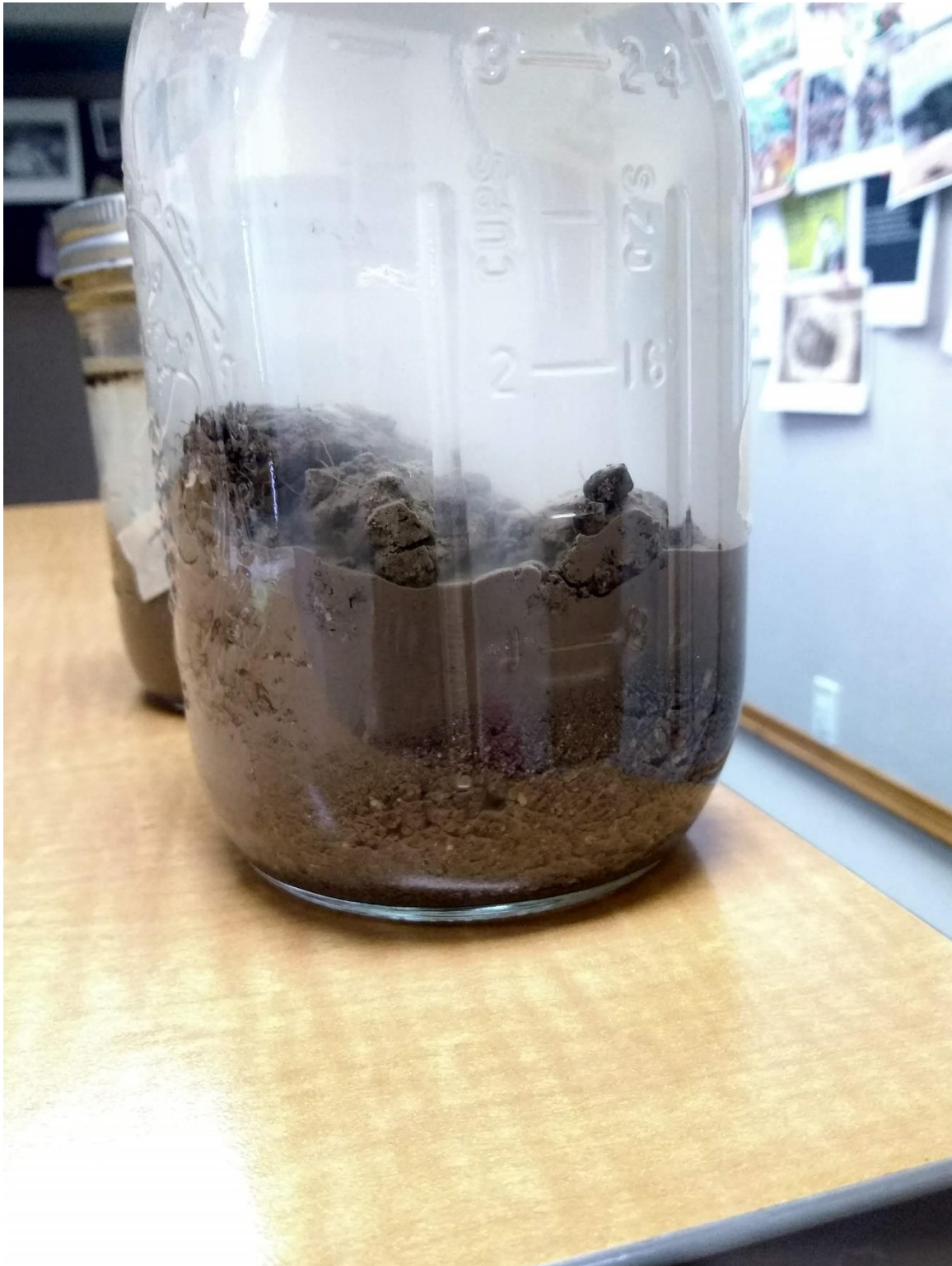


EXHIBIT B





**STAKER PARSON**  
**MATERIALS & CONSTRUCTION**  
 A CRH COMPANY

April 19, 2019

Cache County Trails and Active Transportation Planner  
 Attn: Dayton Crites  
 179 N Main, Suite 305  
 Logan, UT 84321  
 Email: [dayton.crites@cachecounty.org](mailto:dayton.crites@cachecounty.org)  
 Phone: (435) 755-1646  
 Fax: (801)

**Re: Soil Composition**

**Screened Clay**

Dayton Crites:

Staker & Parson Companies is pleased to submit for your review and approval the following Job Mix Gradation for the above-mentioned project.

**Material Source:** Heber Pit (001060) located at 3595 So. 2800 W., Heber, UT 84032

**Material Type:** Clay ()

Sieve	Target	Specification's
1/2"	100%	
3/8"	99.1%	
# 4	95.2%	
# 8	93%	
# 16	90%	
# 30	89%	
# 50	86%	
# 100	82%	
# 200	74.7%	

Suitability Test's	Results
Proctor AASHTO T-99	104.8 lbs/ft <sup>3</sup> @ 18.2%
Permeability Rate	3.8 x 10 <sup>-6</sup> cm/sec
Liquid Limit	43
Plastic Limit	16
Plastic Index	27

This is a typical gradation, generated from daily quality control samples. If you have any questions concerning this letter, please contact me at Cell (801) 514-5132.

Sincerely  
**Staker & Parson Companies**

David Evans  
 Quality Control Engineer

Beck Street PH 801 258-3952  
[www.stakerparson.com](http://www.stakerparson.com)  
 Beck Street Office  
 1730 North Beck Street, Salt Lake City, UT 84116  
 Draper Office, 89 West 13490 South, Draper, UT 84020

ROCK PRODUCTS, READY MIX CONCRETE, ASPHALT, PAVING, & CONSTRUCTION

# EXHIBIT D

## Liquid Limit, Plastic Limit, and Plasticity Index of Soils

(ASTM D4318)



**Project: Staker & Parson Companies**  
**No: M00132-068 (PO #100-309870)**

**Boring No.:**  
**Sample: Heber Clay**  
**Depth: Stockpile**  
**Description: Brown lean clay**

Location: Heber Pit  
 Date: 11/9/2017  
 By: BRR

Grooving tool type: Plastic  
 Liquid limit device: Mechanical  
 Rolling method: Hand

Preparation method: Wet  
 Liquid limit test method: Multipoint  
 Screened over No.40: Yes  
 Larger particles removed: Wet sieved  
 Approximate maximum grain size: 3/4"  
 Estimated percent retained on No.40: See Particle Size Distribution

### Plastic Limit

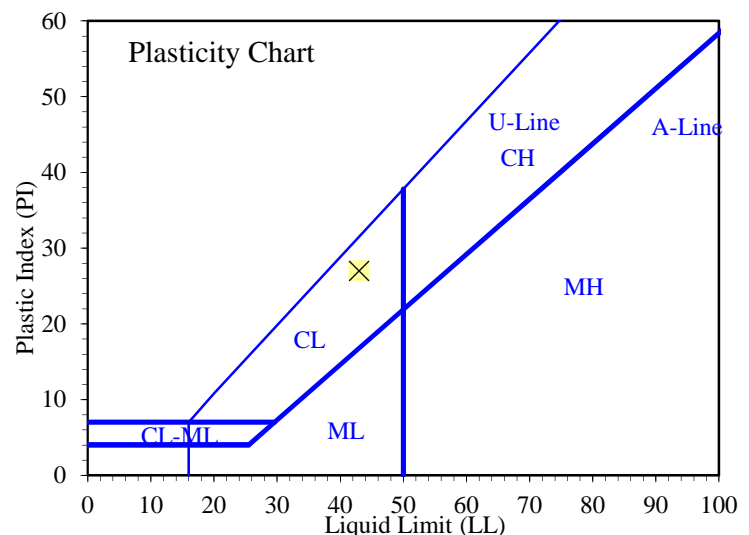
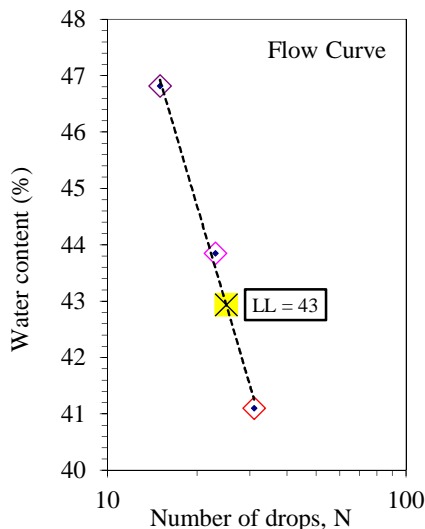
As-received water content (%): Not requested

Determination No	1	2				
Wet Soil + Tare (g)	29.19	27.67				
Dry Soil + Tare (g)	28.10	26.82				
Water Loss (g)	1.09	0.85				
Tare (g)	21.57	21.52				
Dry Soil (g)	6.53	5.30				
Water Content, w (%)	16.69	16.04				

### Liquid Limit

Determination No	1	2	3			
Number of Drops, N	31	23	15			
Wet Soil + Tare (g)	29.42	29.18	29.13			
Dry Soil + Tare (g)	27.18	26.90	26.85			
Water Loss (g)	2.24	2.28	2.28			
Tare (g)	21.73	21.70	21.98			
Dry Soil (g)	5.45	5.20	4.87			
Water Content, w (%)	41.10	43.85	46.82			
One-Point LL (%)		43				

<b>Liquid Limit, LL (%)</b>	<b>43</b>
<b>Plastic Limit, PL (%)</b>	<b>16</b>
<b>Plasticity Index, PI (%)</b>	<b>27</b>



Entered by: \_\_\_\_\_  
 Reviewed: \_\_\_\_\_

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**Particle-Size Analysis of Soils with hydrometer**

(In general accordance with ASTM D422 and ASTM D7928)



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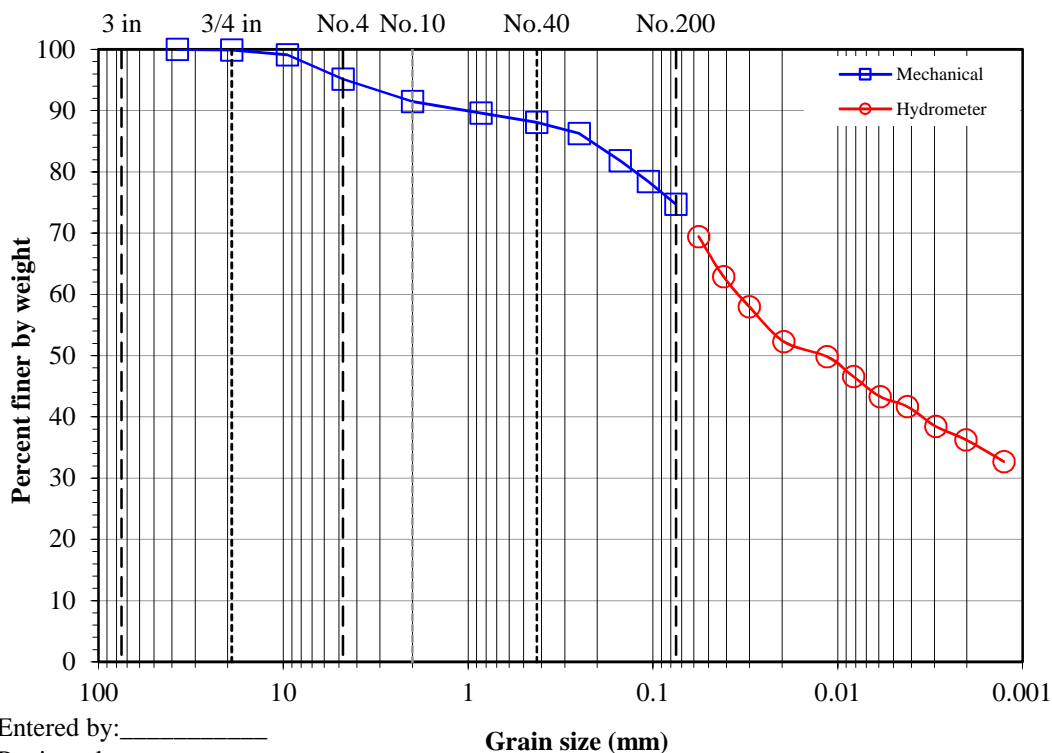
**Project: Staker & Parson Companies**  
**No: M00132-068 (PO #100-309870)**  
 Location: **Heber Pit**  
 Date: **11/10/2017**  
 By: **BRR**

**Boring No.:**  
**Sample: Heber Clay**  
**Depth: Stockpile**  
 Description: **Brown clay with sand**

				Water content data				C.F.(+3/8")		S.F.(-3/8")		Hyd.(+No.10)		Hyd.(-No.10)	
Split:	Yes			Moist soil + tare (g):	525.02	934.36	205.99	56.89							
Split sieve:	3/8"			Dry soil + tare (g):	523.48	884.30	201.14	53.89							
	Moist	Dry		Tare (g):	327.90	310.49	126.84	21.55							
Total sample wt. (g):	22634.90	20832.53		Water content (%):	0.79	8.72	6.53	9.28							
+3/8" Coarse fraction (g):	191.62	190.12		Hydrometer data				Slope:		-0.1641					
-3/8" Split fraction (g):	425.39	399.32		Hyd. split:	No.10		Intercept:		16.3						
Hydrometer fraction (g):	61.79	56.54		Gs:	2.612	Determined		α:		1.01					
Split fraction:	0.991			Bulb No.	4		Hyd. fraction:		91.51						
				Dispersion period (min):	5		Dispersion device:		Air-jet						

Sieve	Accum. Wt. Ret. (g)	Grain Size (mm)	Percent Finer	Elapsed time (min)	Temp. (°C)	Hydrometer Reading	Grain Size (mm)	% Soil in Suspension
8"	-	200	-	0.5	20.9	47	0.05659	69.44
6"	-	150	-	1	20.9	43	0.04152	62.91
4"	-	100	-	2	20.9	40	0.03013	58.01
3"	-	75	-	5	20.9	36.5	0.01961	52.30
1.5"	-	37.5	100.0	15	20.9	35	0.01146	49.85
3/4"	19.08	19	99.9	30	20.9	33	0.00823	46.59
3/8"	190.12	9.5	99.1	60	20.9	31	0.00590	43.32
No.4	15.81	4.75	95.2	120	20.9	30	0.00420	41.69
No.10	30.54	2	91.5	250	21	28	0.00295	38.47
No.20	1.17	0.85	89.6	533	21.5	26.5	0.00203	36.28
No.40	2.11	0.425	88.1	1438	20.9	24.5	0.00126	32.71
No.60	3.24	0.25	86.3					
No.100	5.99	0.15	81.8					
No.140	8.09	0.106	78.4					
No.200	10.38	0.075	74.7					



**Gravel (%): 4.8**  
**Sand (%): 20.5**  
**Fines (%): 74.7**

Entered by: \_\_\_\_\_  
 Reviewed: \_\_\_\_\_

**Grain size (mm)**

**Specific Gravity of Soil Solids by Water Pycnometer**

(ASTM D854)



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**Project: Staker and Parson Companies**

**No: M00132-068 (PO# 100-309870)**

Location: **Heber Pit**

Date: **11/10/2017**

By: **DKS**

Drill hole / Sample:	Heber				
	Clay				
Depth (ft)					
Engineering Classification	Not req.				
Method	A				
Material passing No. 4 sieve, $P$ (%)	95.2				
Pycnometer No.	4				
Mass of pycnometer (g)	169.76				
Mass of pycnometer, soil, and water, $M_{pws,t}$ (g)	698.05				
Temperature, $T_t$ (°C)	21.8				
Mass of pycnometer and water at test temperature, $M_{pw,t}$ (g)	668.37				
Mass of tare + dry soil (g)	358.56				
Mass of tare (g)	310.48				
Mass of soil, $M_s$ (g)	48.08				
Specific gravity of soil solids at test temperature, $G_t$	2.613				
Temperature coefficient, $K$	0.99961				
Specific gravity of soil solids at 20°C, $G_{20°C}$	<b>2.612</b>				
Apparent specific gravity of solids retained on No. 4, $G_{1@20°C}$					
Average specific gravity at 20°C, $G_{avg @20°C}$					

Entered by: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

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**Laboratory Compaction Characteristics of Soil**

(ASTM D698 / D1557)

**Project: Staker and Parson Companies**  
**No: M00132-068 (PO# 100-309870)**

Location: **Heber Pit**  
Date: **11/10/2017**  
By: **DKS**

Method: **ASTM D698 B**  
Mold Id. **Inc 3**  
Mold volume (ft<sup>3</sup>): **0.0332**

**Boring No.:**

**Sample: Heber Clay**

**Depth: Stockpile**

Sample Description: **Brown clay with sand**

Engineering Classification: **Not requested**

As-received water content (%): **Not requested**

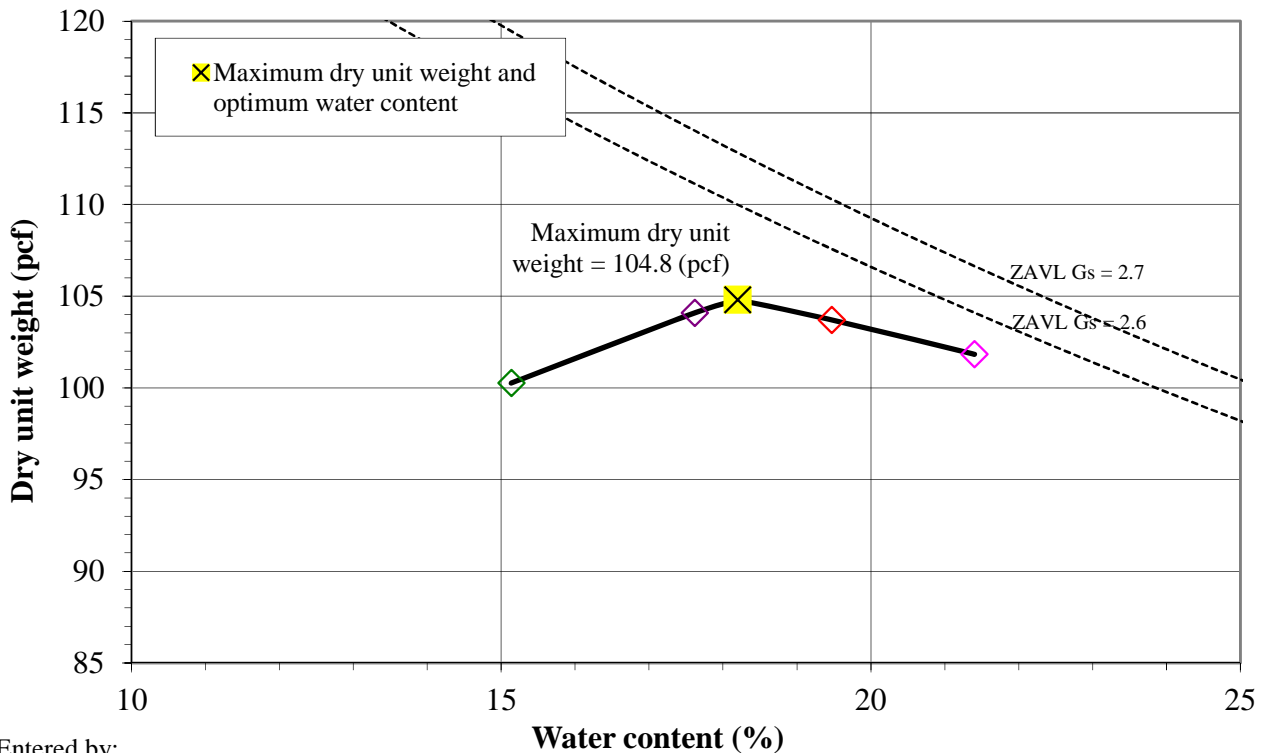
Preparation method: **Moist**

Rammer: **Mechanical-circular face**

Rock Correction: **No**

**Optimum water content (%): 18.2**  
**Maximum dry unit weight (pcf): 104.8**

Point Number	+8%	+10%	+6%	+12%				
Wt. Sample + Mold (g)	6000.4	6022.6	5895.1	6018.4				
Wt. of Mold (g)	4156	4156	4156	4156				
Wet Unit Wt., $\gamma_m$ (pcf)	122.4	123.9	115.4	123.6				
Wet Soil + Tare (g)	1018.63	948.50	880.22	900.75				
Dry Soil + Tare (g)	891.50	821.97	786.64	771.41				
Tare (g)	169.90	172.17	168.43	167.09				
Water Content, w (%)	17.6	19.5	15.1	21.4				
Dry Unit Wt., $\gamma_d$ (pcf)	104.1	103.7	100.3	101.8				



Entered by: \_\_\_\_\_

Reviewed: \_\_\_\_\_



**Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter, Method C (ASTM D5084)**

**Project: Staker and Parson Companies**  
**No: M00132-068 (PO# 100-309870)**  
 Location: **Heber Pit**  
 Date: **11/10/2017**  
 By: **EH/JDF**

**Boring No.:**  
**Sample: Heber Clay**  
**Depth: Stockpile**

Sample Description: **Brown clay with sand**  
 Sample Type: **Laboratory Compacted**  
 Compaction Specifications: **95 (%) Dry unit weight**  
 at **18.2 (%) w**

Optimum water content (%) **18.2**  
 Maximum dry unit weight (pcf) **104.8**  
 Gs **2.612 Determined**  
 Cell No. **1**  
 Station No. **1**  
 Permeant liquid used **De-aired tap water**  
 Total backpressure (psi) **40**  
 Effective horiz. consolidation stress (psi) **5**  
 Effective vert. consolidation stress (psi) **5**

	Initial (o)	Final (f)
Sample Height, H (in)	3.126	3.124
Sample Diameter, D (in)	2.873	2.87
Sample Length, L (cm)	7.940	7.935
Sample Area, A (cm <sup>2</sup> )	41.824	41.680
Sample Volume, V (cm <sup>3</sup> )	332.09	330.72
Wt. Rings + Wet Soil (g)	625.33	672.97
Wt. Rings (g)	0	0
Wet Unit Wt., $\gamma_m$ (pcf)	117.6	127.0
Wet Soil + Tare (g)	221.13	790.14
Dry Soil + Tare (g)	205.66	647.55
Tare (g)	120.9	124.5
Weight of solids, W <sub>s</sub> (g)	528.81	528.81
Water Content, w (%)	18.25	27.26
Dry Unit Wt., $\gamma_d$ (pcf)	99.4	99.8
Void ratio, e	0.64	0.71
Saturation (%)	74.5	100 <sup>a</sup>
<b>Average K<sup>b</sup> (cm/sec)</b>	<b>3.8E-06</b>	

<sup>a</sup> Saturation set to 100% for phase calculations  
<sup>b</sup> K corrected to 20°C

	Initial (o)	Final (f)
B value	0.60	0.98
External Burette (cm <sup>3</sup> )	15.20	23.30
Cell Pressure (psi)	0.0	45.0
Backpressure bottom (psi)	40.0	
Backpressure top (psi)	40.0	
System volume coefficient (cm <sup>3</sup> /psi)	0.150	
System volume change (cm <sup>3</sup> )	6.74	
Net sample volume change (cm <sup>3</sup> )	-1.36	
Bottom burette ground length, l <sub>b</sub> (cm)	82.00	
Top burette ground length, l <sub>t</sub> (cm)	82.1	
Burette area, a (cm <sup>2</sup> )	0.197	
Conversion, reading to cm head (cm/rd)	5.076	

Start Date and Time:		11/9/17	9:17						
Elapsed time (sec)	Bottom Burette (cm <sup>3</sup> )	Top Burette (cm <sup>3</sup> )	h <sub>1</sub> (cm)	h <sub>2</sub> (cm)	K (cm/sec)	Temp (°C)	Visc. Ratic R <sub>T</sub>	K <sup>b</sup> (cm/sec)	
120.0	0.13 0.26	9.72 9.58	48.58	47.21	4.5E-06	22.4 22.6	0.94	4.2E-06	
120.0	0.26 0.38	9.58 9.46	47.21	45.99	4.1E-06	22.6 22.6	0.94	3.8E-06	
120.0	0.38 0.50	9.46 9.35	45.99	44.82	4.0E-06	22.6 22.8	0.94	3.8E-06	
120.0	0.50 0.61	9.35 9.24	44.82	43.71	3.9E-06	22.8 22.4	0.94	3.7E-06	
120.0	0.61 0.73	9.24 9.15	43.71	42.64	3.9E-06	22.4 22.4	0.94	3.6E-06	
120.0	0.73 0.83	9.15 9.06	42.64	41.68	3.6E-06	22.4 22.0	0.95	3.4E-06	

Entered by: \_\_\_\_\_  
 Reviewed: \_\_\_\_\_