

Unconsolidated Undrained (UU)

Project Name: BYU (Dr. Youd)

Project Number:

Sample: GVDA

Depth: 12.5-15 feet

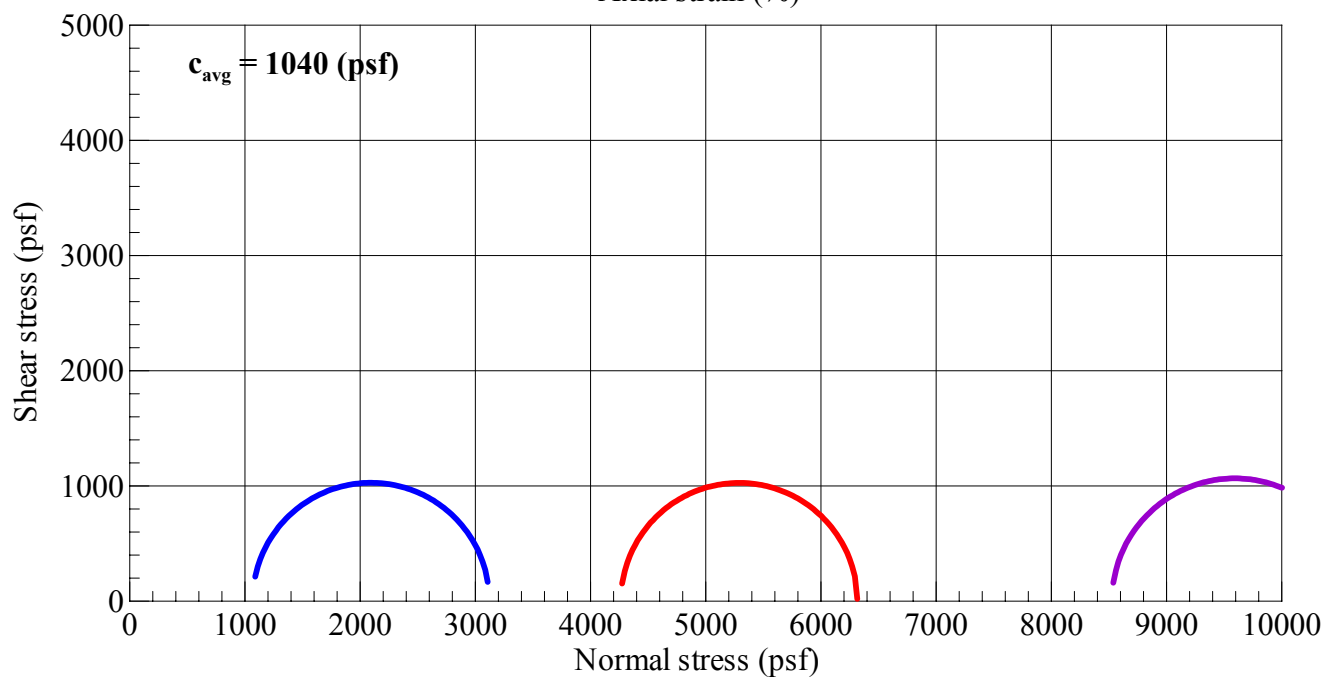
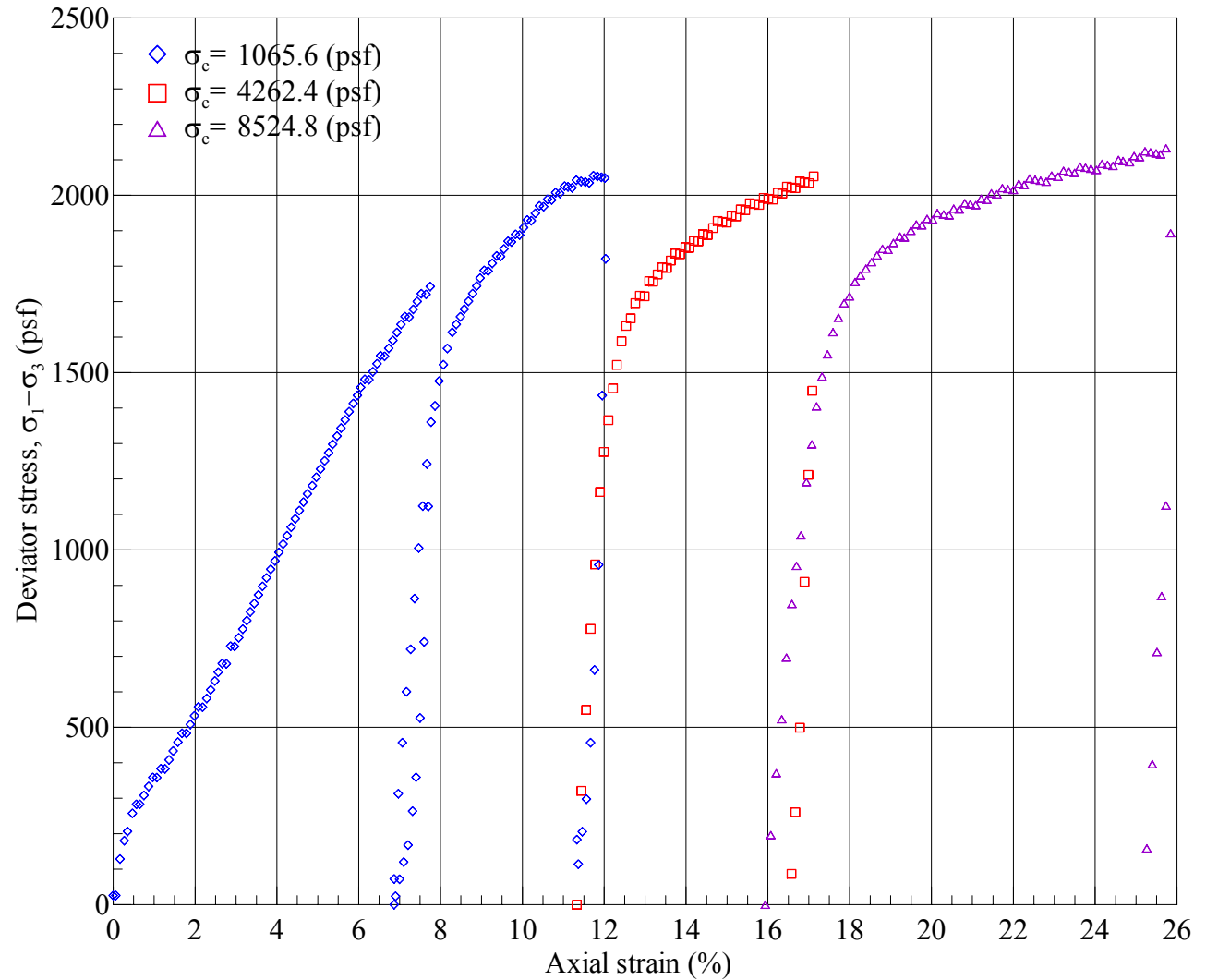
Phase			1		2		3	
Initial		w (%)	18.1		Multi-Staged Test			
		γ_m (pcf)	141.1					
		γ_d (pcf)	119.4					
		B	0.68					
Final		w (%)					19.1	
		γ_m (pcf)					144.9	
		γ_d (pcf)					121.6	
		B					0.97	
Back pressure (psi)			34.5		34.5		34.5	
Strain rate (in/min)			0.0180		0.0180		0.0180	
Stress conditions			Peak $\sigma^1\text{-}\sigma^3$	Max σ^1/σ^3	Peak $\sigma^1\text{-}\sigma^3$	Max σ^1/σ^3	Peak $\sigma^1\text{-}\sigma^3$	Max σ^1/σ^3
Total Stress at Failure	Time to Fail (min)		46.3		17.7		25.0	
	ε (%)		11.73		17.12		25.73	
	σ^3 (psf)		1066		4262		8525	
	$\sigma^1\text{-}\sigma^3$ (psf)		2056		2053		2132	
	σ^1 (psf)		3121		6316		10657	
	$P = (\sigma^1\text{+}\sigma^3)/2$ (psf)		2093		5289		9591	
	$Q = (\sigma^1\text{-}\sigma^3)/2$ (psf)		1028		1027		1066	
	Shear stress at failure, τ_f (psf)		1028		1027		1066	

Average shear stress at failure, τ_f (psf)	1040
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Increased from 7.4 to 14.8 psi during phase 1 unload

Tested by: _____

Reviewed: _____



Multi-Staged Triaxial Test
Unconsolidated Undrained (UU)



Project: **BYU (Dr. Youd)**

Phase 1

Number: **M00399-003**

Confining Stress = 1066 (psf)

Sample: **GVDA**

Depth: **12.5-15 feet**

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Axial strain, ϵ (%)	σ_d ($\sigma_1 - \sigma_3$) (psf)	Total σ_3 (psf)	Total σ_1 (psf)	Q = s_u ($\sigma_1 - \sigma_3$)/2 (psf)	P ($\sigma_1 + \sigma_3$)/2 (psf)	σ_1/σ_3
0.00	26	1066	1091	13	1079	1.02
0.07	26	1066	1091	13	1079	1.02
0.17	129	1066	1195	65	1130	1.12
0.27	181	1066	1246	90	1156	1.17
0.35	206	1066	1272	103	1169	1.19
0.47	258	1066	1323	129	1194	1.24
0.57	283	1066	1349	142	1207	1.27
0.65	283	1066	1348	141	1207	1.27
0.75	308	1066	1374	154	1220	1.29
0.87	333	1066	1399	167	1232	1.31
0.97	359	1066	1424	179	1245	1.34
1.07	358	1066	1424	179	1245	1.34
1.17	384	1066	1449	192	1257	1.36
1.27	383	1066	1449	192	1257	1.36
1.37	408	1066	1474	204	1270	1.38
1.47	433	1066	1499	217	1282	1.41
1.58	458	1066	1524	229	1295	1.43
1.68	483	1066	1549	242	1307	1.45
1.78	483	1066	1548	241	1307	1.45
1.88	508	1066	1573	254	1319	1.48
1.98	533	1066	1598	266	1332	1.50
2.08	557	1066	1623	279	1344	1.52
2.18	557	1066	1622	278	1344	1.52
2.28	582	1066	1647	291	1356	1.55
2.38	606	1066	1672	303	1369	1.57
2.48	631	1066	1696	315	1381	1.59
2.57	656	1066	1721	328	1393	1.62
2.67	680	1066	1746	340	1406	1.64
2.77	679	1066	1745	340	1405	1.64
2.87	729	1066	1795	364	1430	1.68
2.97	728	1066	1794	364	1430	1.68
3.07	752	1066	1818	376	1442	1.71
3.17	777	1066	1842	388	1454	1.73
3.27	801	1066	1867	400	1466	1.75
3.35	825	1066	1891	413	1478	1.77
3.45	849	1066	1915	425	1490	1.80
3.55	874	1066	1939	437	1502	1.82
3.65	898	1066	1963	449	1514	1.84
3.75	922	1066	1987	461	1526	1.86
3.85	945	1066	2011	473	1538	1.89
3.95	969	1066	2035	485	1550	1.91
4.05	993	1066	2059	497	1562	1.93
4.15	1017	1066	2082	508	1574	1.95
4.25	1041	1066	2106	520	1586	1.98
4.35	1064	1066	2130	532	1598	2.00
4.45	1088	1066	2153	544	1610	2.02
4.55	1111	1066	2177	556	1621	2.04
4.65	1135	1066	2201	567	1633	2.07
4.75	1158	1066	2224	579	1645	2.09
4.87	1182	1066	2247	591	1656	2.11
4.97	1205	1066	2271	602	1668	2.13
5.07	1228	1066	2294	614	1680	2.15
5.17	1252	1066	2317	626	1691	2.17
5.27	1275	1066	2340	637	1703	2.20
5.37	1298	1066	2363	649	1715	2.22
5.47	1321	1066	2387	660	1726	2.24
5.57	1344	1066	2410	672	1738	2.26
5.67	1367	1066	2433	683	1749	2.28
5.77	1390	1066	2455	695	1761	2.30
5.87	1413	1066	2478	706	1772	2.33
5.97	1436	1066	2501	718	1783	2.35
6.05	1459	1066	2524	729	1795	2.37
6.15	1481	1066	2547	741	1806	2.39
6.25	1480	1066	2545	740	1805	2.39
6.35	1502	1066	2568	751	1817	2.41
6.45	1525	1066	2591	763	1828	2.43
6.53	1548	1066	2613	774	1840	2.45

Project: **BYU (Dr. Youd)**

Phase 1

Number: **M00399-003**

Confining Stress = 1066 (psf)

Sample: **GVDA**Depth: **12.5-15 feet**

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Axial strain, ϵ (%)	σ_d ($\sigma_1 - \sigma_3$) (psf)	Total σ_3 (psf)	Total σ_1 (psf)	$Q = s_u$ ($\sigma_1 - \sigma_3$)/2 (psf)	P ($\sigma_1 + \sigma_3$)/2 (psf)	σ_1/σ_3
6.63	1546	1066	2612	773	1839	2.45
6.73	1569	1066	2634	784	1850	2.47
6.83	1591	1066	2657	796	1861	2.49
6.93	1614	1066	2679	807	1872	2.51
7.03	1636	1066	2701	818	1884	2.54
7.13	1658	1066	2724	829	1895	2.56
7.23	1656	1066	2722	828	1894	2.55
7.33	1679	1066	2744	839	1905	2.58
7.43	1701	1066	2766	850	1916	2.60
7.53	1723	1066	2788	861	1927	2.62
7.65	1721	1066	2786	860	1926	2.61
7.75	1743	1066	2808	871	1937	2.64
7.70	1123	1066	2188	561	1627	2.05
7.60	741	1066	1807	371	1436	1.70
7.50	527	1066	1592	263	1329	1.49
7.40	359	1066	1425	180	1245	1.34
7.32	264	1066	1329	132	1198	1.25
7.20	168	1066	1234	84	1150	1.16
7.10	120	1066	1186	60	1126	1.11
7.00	72	1066	1138	36	1102	1.07
6.90	24	1066	1090	12	1078	1.02
6.87	0	1066	1066	0	1066	1.00
6.87	72	1066	1138	36	1102	1.07
6.97	313	1066	1379	156	1222	1.29
7.07	457	1066	1523	228	1294	1.43
7.17	601	1066	1666	300	1366	1.56
7.27	720	1066	1785	360	1426	1.68
7.37	863	1066	1929	431	1497	1.81
7.47	1006	1066	2071	503	1568	1.94
7.57	1124	1066	2190	562	1628	2.05
7.67	1242	1066	2308	621	1687	2.17
7.77	1360	1066	2426	680	1746	2.28
7.87	1407	1066	2472	703	1769	2.32
7.97	1477	1066	2542	738	1804	2.39
8.07	1522	1066	2588	761	1827	2.43
8.17	1568	1066	2634	784	1850	2.47
8.28	1614	1066	2679	807	1873	2.51
8.38	1636	1066	2701	818	1883	2.54
8.48	1658	1066	2723	829	1894	2.56
8.58	1680	1066	2745	840	1905	2.58
8.68	1701	1066	2767	851	1916	2.60
8.78	1723	1066	2789	862	1927	2.62
8.88	1745	1066	2810	872	1938	2.64
8.97	1767	1066	2832	883	1949	2.66
9.07	1788	1066	2854	894	1960	2.68
9.17	1786	1066	2852	893	1959	2.68
9.27	1808	1066	2873	904	1970	2.70
9.37	1829	1066	2895	915	1980	2.72
9.47	1827	1066	2893	914	1979	2.71
9.55	1849	1066	2915	925	1990	2.74
9.65	1870	1066	2936	935	2001	2.76
9.73	1869	1066	2934	934	2000	2.75
9.83	1890	1066	2955	945	2011	2.77
9.93	1888	1066	2953	944	2009	2.77
10.03	1909	1066	2975	954	2020	2.79
10.12	1930	1066	2996	965	2031	2.81
10.22	1928	1066	2994	964	2030	2.81
10.32	1949	1066	3015	975	2040	2.83
10.42	1970	1066	3036	985	2051	2.85
10.52	1968	1066	3034	984	2050	2.85
10.62	1989	1066	3055	995	2060	2.87
10.72	1987	1066	3052	993	2059	2.86
10.82	2008	1066	3073	1004	2069	2.88
10.92	2005	1066	3071	1003	2068	2.88
11.03	2026	1066	3091	1013	2079	2.90
11.12	2024	1066	3090	1012	2078	2.90
11.22	2022	1066	3087	1011	2076	2.90
11.32	2042	1066	3108	1021	2087	2.92
11.43	2040	1066	3105	1020	2085	2.91
11.53	2037	1066	3103	1019	2084	2.91
11.63	2035	1066	3101	1018	2083	2.91

Project: **BYU (Dr. Youd)**

Phase 1

Number: **M00399-003**

Confining Stress = 1066 (psf)

Sample: **GVDA**

Depth: **12.5-15 feet**

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Axial strain, ϵ (%)	σ_d ($\sigma_1 - \sigma_3$) (psf)	Total σ_3 (psf)	Total σ_1 (psf)	$Q = s_u$ ($\sigma_1 - \sigma_3$)/2 (psf)	P ($\sigma_1 + \sigma_3$)/2 (psf)	σ_1/σ_3
11.73	2056	1066	3121	1028	2093	2.93
11.83	2053	1066	3119	1027	2092	2.93
11.93	2051	1066	3117	1025	2091	2.92
12.02	2049	1066	3115	1025	2090	2.92
12.03	1821	1066	2887	911	1976	2.71
11.95	1435	1066	2501	718	1783	2.35
11.87	958	1066	2023	479	1545	1.90
11.77	662	1066	1728	331	1397	1.62
11.67	457	1066	1523	229	1294	1.43
11.57	297	1066	1363	149	1214	1.28
11.47	206	1066	1272	103	1169	1.19
11.37	115	1066	1180	57	1123	1.11
11.33	184	1066	1249	92	1157	1.17

Multi-Staged Triaxial Test
Unconsolidated Undrained (UU)



Project: **BYU (Dr. Youd)**

Phase 2

Number: **M00399-003**

Confining Stress = 4262 (psf)

Sample: **GVDA**

Depth: **12.5-15 feet**

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Axial strain, ϵ (%)	σ_d ($\sigma_1 - \sigma_3$) (psf)	Total σ_3 (psf)	Total σ_1 (psf)	Q = su ($(\sigma_1 - \sigma_3)/2$) (psf)	P ($(\sigma_1 + \sigma_3)/2$) (psf)	σ_1/σ_3
11.33	0	4262	4262	0	4262	1.00
11.45	321	4262	4583	160	4423	1.08
11.56	549	4262	4812	275	4537	1.13
11.67	777	4262	5040	389	4651	1.18
11.78	959	4262	5222	480	4742	1.23
11.90	1164	4262	5426	582	4844	1.27
11.99	1276	4262	5539	638	4901	1.30
12.10	1366	4262	5628	683	4945	1.32
12.22	1455	4262	5718	728	4990	1.34
12.31	1522	4262	5785	761	5023	1.36
12.42	1589	4262	5851	794	5057	1.37
12.54	1632	4262	5894	816	5078	1.38
12.65	1653	4262	5915	826	5089	1.39
12.76	1696	4262	5959	848	5110	1.40
12.87	1717	4262	5979	858	5121	1.40
12.99	1715	4262	5977	857	5120	1.40
13.10	1758	4262	6020	879	5141	1.41
13.19	1756	4262	6019	878	5141	1.41
13.31	1777	4262	6039	888	5151	1.42
13.42	1797	4262	6060	899	5161	1.42
13.53	1795	4262	6058	898	5160	1.42
13.63	1816	4262	6078	908	5170	1.43
13.74	1836	4262	6099	918	5180	1.43
13.85	1834	4262	6096	917	5179	1.43
13.98	1854	4262	6116	927	5189	1.43
14.08	1852	4262	6114	926	5188	1.43
14.19	1872	4262	6135	936	5199	1.44
14.30	1870	4262	6132	935	5197	1.44
14.42	1890	4262	6152	945	5207	1.44
14.53	1888	4262	6150	944	5206	1.44
14.66	1908	4262	6170	954	5216	1.45
14.77	1927	4262	6190	964	5226	1.45
14.89	1925	4262	6188	963	5225	1.45
15.00	1923	4262	6185	961	5224	1.45
15.11	1943	4262	6205	971	5234	1.46
15.22	1940	4262	6203	970	5233	1.46
15.34	1960	4262	6223	980	5243	1.46
15.45	1958	4262	6220	979	5241	1.46
15.56	1978	4262	6240	989	5251	1.46
15.68	1975	4262	6238	988	5250	1.46
15.79	1973	4262	6235	986	5249	1.46
15.90	1993	4262	6255	996	5259	1.47
16.01	1990	4262	6253	995	5257	1.47
16.13	1988	4262	6250	994	5256	1.47
16.24	2007	4262	6270	1004	5266	1.47
16.35	2005	4262	6267	1002	5265	1.47
16.46	2024	4262	6287	1012	5275	1.47
16.58	2022	4262	6284	1011	5273	1.47
16.67	2020	4262	6282	1010	5272	1.47
16.78	2039	4262	6302	1020	5282	1.48
16.90	2037	4262	6299	1018	5281	1.48
17.01	2034	4262	6297	1017	5280	1.48
17.12	2053	4262	6316	1027	5289	1.48
17.09	1449	4262	5711	724	4987	1.34
16.99	1212	4262	5475	606	4868	1.28
16.90	910	4262	5172	455	4717	1.21
16.78	499	4262	4761	249	4512	1.12
16.67	261	4262	4523	130	4393	1.06
16.58	87	4262	4349	43	4306	1.02
16.46	-44	4262	4219	-22	4241	0.99
16.37	-153	4262	4110	-76	4186	0.96
16.26	-218	4262	4044	-109	4153	0.95
16.15	-284	4262	3978	-142	4120	0.93
16.03	-328	4262	3934	-164	4098	0.92
15.94	-350	4262	3912	-175	4087	0.92

Multi-Staged Triaxial Test
Unconsolidated Undrained (UU)



Project: **BYU (Dr. Yound)**

Phase 3

Number: **M00399-003**

Confining Stress = 8525 (psf)

Sample: **GVDA**

Depth: **12.5-15 feet**

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Axial strain, ϵ (%)	σ_d ($\sigma_1 - \sigma_3$) (psf)	Total σ_3 (psf)	Total σ_1 (psf)	$Q = s_u$ ($\sigma_1 - \sigma_3$)/2 (psf)	P ($\sigma_1 + \sigma_3$)/2 (psf)	σ_1/σ_3
15.94	0	8525	8525	0	8525	1.00
16.07	197	8525	8722	98	8623	1.02
16.21	371	8525	8896	186	8710	1.04
16.34	523	8525	9048	262	8786	1.06
16.45	697	8525	9222	348	8873	1.08
16.59	848	8525	9373	424	8949	1.10
16.70	956	8525	9481	478	9003	1.11
16.81	1041	8525	9566	521	9046	1.12
16.94	1192	8525	9716	596	9121	1.14
17.08	1298	8525	9823	649	9174	1.15
17.19	1405	8525	9930	702	9227	1.16
17.32	1489	8525	10014	745	9269	1.17
17.46	1552	8525	10077	776	9301	1.18
17.59	1614	8525	10139	807	9332	1.19
17.73	1655	8525	10180	828	9352	1.19
17.86	1696	8525	10221	848	9373	1.20
18.00	1715	8525	10240	857	9382	1.20
18.13	1755	8525	10280	878	9403	1.21
18.26	1774	8525	10299	887	9412	1.21
18.40	1793	8525	10318	897	9421	1.21
18.53	1812	8525	10337	906	9431	1.21
18.67	1831	8525	10356	915	9440	1.21
18.80	1850	8525	10374	925	9450	1.22
18.93	1847	8525	10372	924	9448	1.22
19.07	1866	8525	10391	933	9458	1.22
19.23	1884	8525	10409	942	9467	1.22
19.34	1882	8525	10407	941	9466	1.22
19.49	1900	8525	10425	950	9475	1.22
19.63	1918	8525	10443	959	9484	1.23
19.76	1916	8525	10440	958	9483	1.22
19.90	1934	8525	10459	967	9492	1.23
20.03	1931	8525	10456	966	9490	1.23
20.14	1950	8525	10475	975	9500	1.23
20.30	1947	8525	10472	973	9498	1.23
20.43	1944	8525	10469	972	9497	1.23
20.54	1963	8525	10487	981	9506	1.23
20.68	1960	8525	10485	980	9505	1.23
20.81	1978	8525	10503	989	9514	1.23
20.95	1975	8525	10500	988	9512	1.23
21.08	1972	8525	10497	986	9511	1.23
21.22	1990	8525	10515	995	9520	1.23
21.35	1987	8525	10512	994	9519	1.23
21.46	2006	8525	10531	1003	9528	1.24
21.60	2003	8525	10528	1001	9526	1.23
21.73	2021	8525	10546	1010	9535	1.24
21.86	2018	8525	10543	1009	9534	1.24
22.00	2015	8525	10540	1007	9532	1.24
22.13	2033	8525	10557	1016	9541	1.24
22.27	2030	8525	10554	1015	9540	1.24
22.40	2047	8525	10572	1024	9548	1.24
22.54	2044	8525	10569	1022	9547	1.24
22.67	2041	8525	10566	1021	9545	1.24
22.80	2038	8525	10563	1019	9544	1.24
22.94	2056	8525	10581	1028	9553	1.24
23.09	2052	8525	10577	1026	9551	1.24
23.23	2070	8525	10595	1035	9560	1.24
23.36	2067	8525	10592	1033	9558	1.24
23.50	2064	8525	10589	1032	9557	1.24
23.63	2081	8525	10606	1040	9565	1.24
23.76	2078	8525	10603	1039	9564	1.24
23.90	2075	8525	10600	1037	9562	1.24
24.03	2072	8525	10597	1036	9561	1.24
24.17	2089	8525	10614	1044	9569	1.25
24.30	2086	8525	10611	1043	9568	1.24
24.44	2083	8525	10608	1041	9566	1.24
24.57	2100	8525	10625	1050	9575	1.25
24.68	2097	8525	10622	1049	9573	1.25

Project: **BYU (Dr. Youd)**

Phase 3

Number: **M00399-003**

Confining Stress = 8525 (psf)

Sample: **GVDA**

Depth: **12.5-15 feet**

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Axial strain, ϵ (%)	σ_d ($\sigma_1 - \sigma_3$) (psf)	Total σ_3 (psf)	Total σ_1 (psf)	$Q = s_u$ ($\sigma_1 - \sigma_3$)/2 (psf)	P ($\sigma_1 + \sigma_3$)/2 (psf)	σ_1/σ_3
24.84	2094	8525	10618	1047	9572	1.25
24.95	2111	8525	10636	1055	9580	1.25
25.08	2108	8525	10633	1054	9579	1.25
25.22	2125	8525	10649	1062	9587	1.25
25.35	2121	8525	10646	1061	9586	1.25
25.49	2118	8525	10643	1059	9584	1.25
25.60	2116	8525	10640	1058	9583	1.25
25.73	2132	8525	10657	1066	9591	1.25
25.84	1893	8525	10418	947	9471	1.22
25.73	1125	8525	9650	563	9087	1.13
25.62	870	8525	9395	435	8960	1.10
25.51	713	8525	9237	356	8881	1.08
25.40	396	8525	8921	198	8723	1.05
25.26	159	8525	8684	79	8604	1.02
25.13	-20	8525	8505	-10	8515	1.00
24.93	-239	8525	8286	-120	8405	0.97