

**Unconsolidated Undrained (UU)**Project Name: **BYU (Dr. Youd)**

Project Number:

Sample: **GVDA**Depth: **15.5-18 feet**

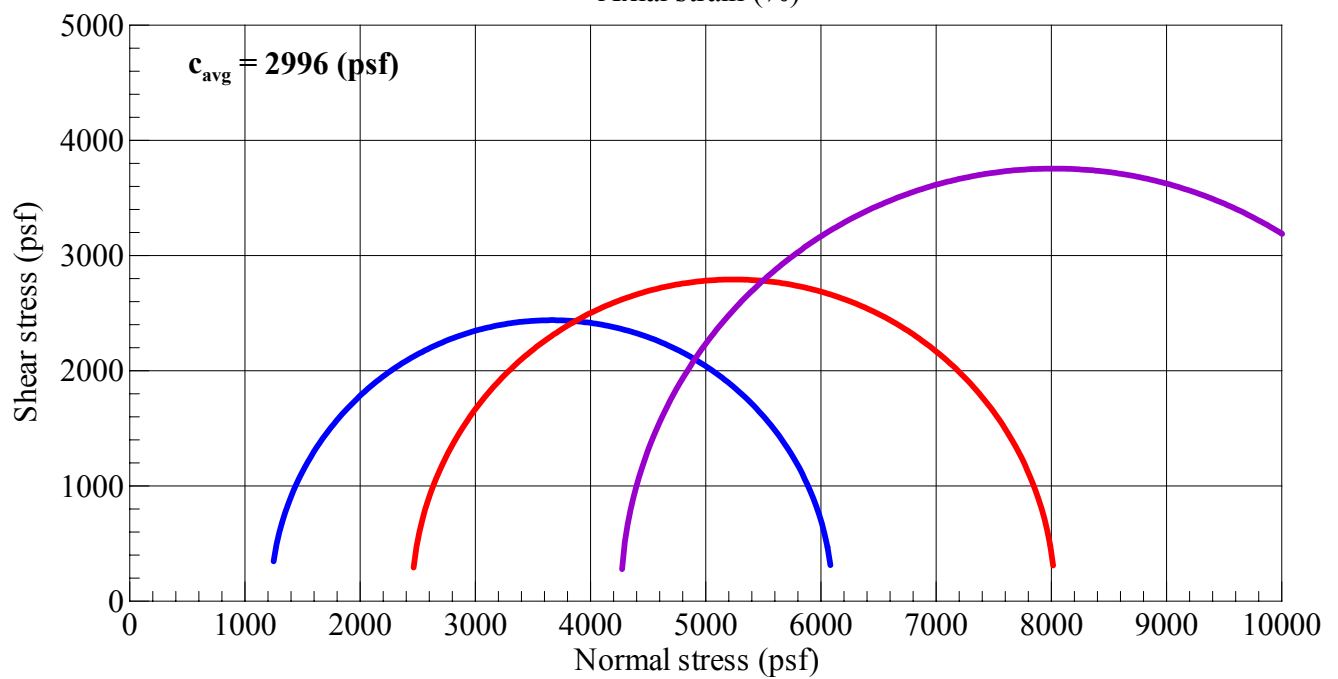
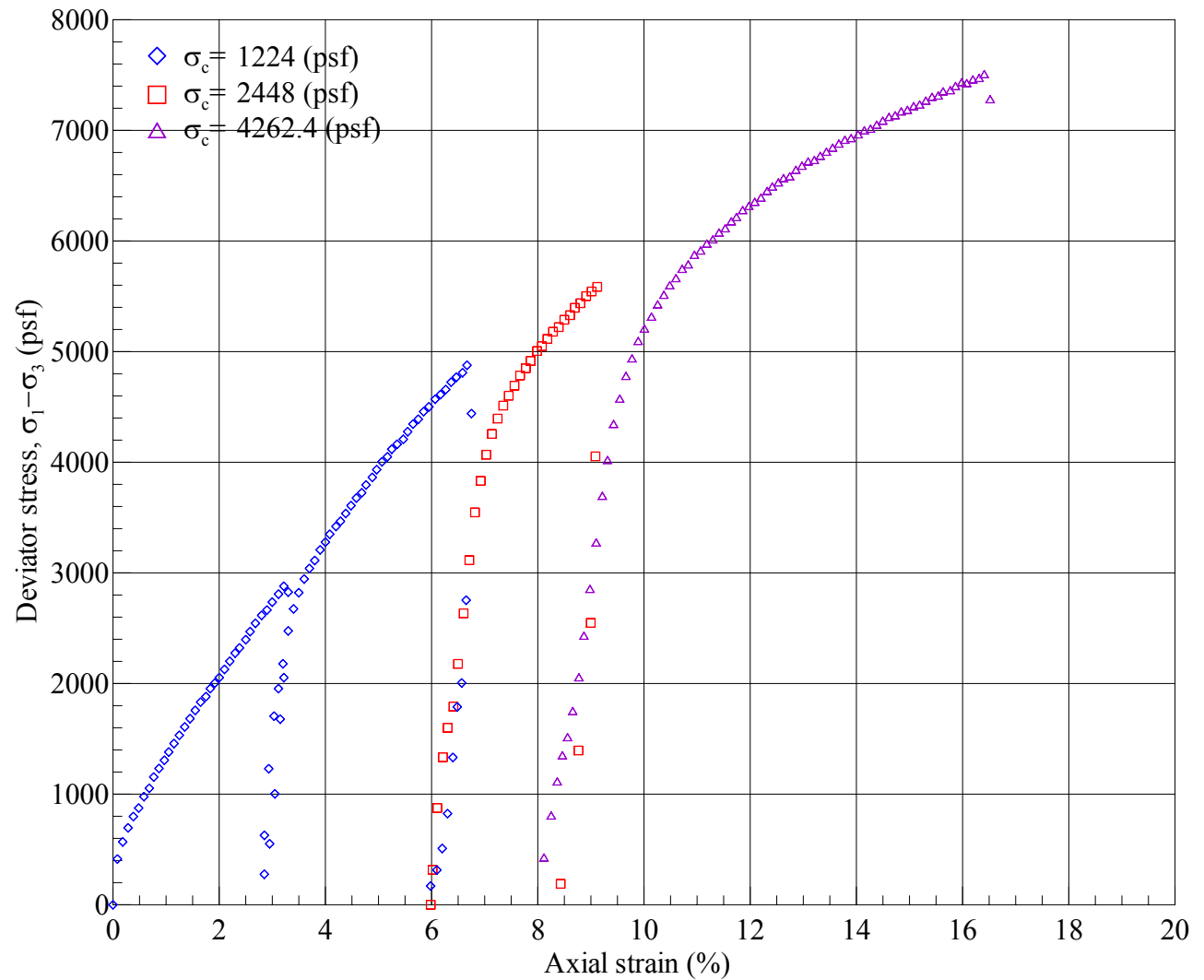
Phase			1		2		3	
Initial		w (%)	19.9		Multi-Staged Test			
		$\gamma_m$ (pcf)	133.9					
		$\gamma_d$ (pcf)	111.7					
		B	0.76					
Final		w (%)					19.7	
		$\gamma_m$ (pcf)					136.5	
		$\gamma_d$ (pcf)					114.1	
		B					0.97	
Back pressure (psi)			29.5		29.5		29.5	
Strain rate (in/min)			0.0180		0.0180		0.0180	
Stress conditions			Peak $\sigma^1\text{-}\sigma^3$	Max $\sigma^1\text{'}/\sigma^3$	Peak $\sigma^1\text{-}\sigma^3$	Max $\sigma^1\text{'}/\sigma^3$	Peak $\sigma^1\text{-}\sigma^3$	Max $\sigma^1\text{'}/\sigma^3$
Total Stress at Failure	Time to Fail (min)		26.7		10.7		25.3	
	$\varepsilon$ (%)		6.67		9.12		16.41	
	$\sigma^3$ (psf)		1224		2448		4262	
	$\sigma^1\text{-}\sigma^3$ (psf)		4879		5585		7511	
	$\sigma^1$ (psf)		6103		8033		11773	
	$P = (\sigma^1\text{+}\sigma^3)/2$ (psf)		3663		5240		8018	
	$Q = (\sigma^1\text{-}\sigma^3)/2$ (psf)		2439		2792		3755	
	Shear stress at failure, $\tau_f$ (psf)		2439		2792		3755	

<b>Average shear stress at failure, <math>\tau_f</math> (psf)</b>	<b>2996</b>
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This sample contained excessive sand and gravel and behaved essentially as a cohesionless soil. Recommend running gradations to determine if the soil is cohesive or cohesionless.

Tested by: \_\_\_\_\_

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



**Multi-Staged Triaxial Test**  
**Unconsolidated Undrained (UU)**



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

Phase 1

Number: **M00399-003**

Confining Stress = 1224 (psf)

Sample: **GVDA**

Depth: **15.5-18 feet**

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Axial strain, $\epsilon$ (%)	$\sigma_d$ ( $\sigma_1 - \sigma_3$ ) (psf)	Total $\sigma_3$ (psf)	Total $\sigma_1$ (psf)	$Q = s_u$ ( $\sigma_1 - \sigma_3$ )/2 (psf)	$P$ ( $\sigma_1 + \sigma_3$ )/2 (psf)	$\sigma_1/\sigma_3$
0.00	0	1224	1224	0	1224	1.00
0.08	414	1224	1638	207	1431	1.34
0.18	568	1224	1792	284	1508	1.46
0.28	697	1224	1921	348	1572	1.57
0.38	799	1224	2023	400	1624	1.65
0.48	876	1224	2100	438	1662	1.72
0.58	978	1224	2202	489	1713	1.80
0.68	1054	1224	2278	527	1751	1.86
0.77	1156	1224	2380	578	1802	1.94
0.87	1231	1224	2455	616	1840	2.01
0.97	1307	1224	2531	653	1877	2.07
1.05	1383	1224	2607	691	1915	2.13
1.15	1458	1224	2682	729	1953	2.19
1.25	1533	1224	2757	767	1991	2.25
1.35	1608	1224	2832	804	2028	2.31
1.45	1683	1224	2907	842	2066	2.38
1.55	1758	1224	2982	879	2103	2.44
1.65	1832	1224	3056	916	2140	2.50
1.75	1881	1224	3105	941	2165	2.54
1.83	1956	1224	3180	978	2202	2.60
1.92	2005	1224	3229	1003	2227	2.64
2.00	2054	1224	3278	1027	2251	2.68
2.10	2128	1224	3352	1064	2288	2.74
2.20	2202	1224	3426	1101	2325	2.80
2.30	2275	1224	3499	1138	2362	2.86
2.38	2324	1224	3548	1162	2386	2.90
2.50	2397	1224	3621	1198	2422	2.96
2.58	2470	1224	3694	1235	2459	3.02
2.68	2543	1224	3767	1272	2496	3.08
2.80	2616	1224	3840	1308	2532	3.14
2.90	2663	1224	3887	1332	2556	3.18
3.00	2736	1224	3960	1368	2592	3.24
3.12	2808	1224	4032	1404	2628	3.29
3.22	2880	1224	4104	1440	2664	3.35
3.30	2828	1224	4052	1414	2638	3.31
3.22	2054	1224	3278	1027	2251	2.68
3.15	1679	1224	2903	840	2064	2.37
3.05	1003	1224	2227	502	1726	1.82
2.95	552	1224	1776	276	1500	1.45
2.85	277	1224	1501	138	1362	1.23
2.85	628	1224	1852	314	1538	1.51
2.93	1231	1224	2455	615	1839	2.01
3.03	1706	1224	2930	853	2077	2.39
3.12	1955	1224	3179	978	2202	2.60
3.20	2179	1224	3403	1090	2314	2.78
3.30	2477	1224	3701	1239	2463	3.02
3.40	2675	1224	3899	1337	2561	3.19
3.50	2822	1224	4046	1411	2635	3.31
3.60	2943	1224	4167	1472	2696	3.40
3.70	3040	1224	4264	1520	2744	3.48
3.80	3112	1224	4336	1556	2780	3.54
3.90	3208	1224	4432	1604	2828	3.62
4.00	3279	1224	4503	1640	2864	3.68
4.08	3351	1224	4575	1675	2899	3.74
4.20	3421	1224	4645	1710	2934	3.79
4.28	3468	1224	4692	1734	2958	3.83
4.38	3538	1224	4762	1769	2993	3.89
4.48	3609	1224	4833	1804	3028	3.95
4.58	3679	1224	4903	1839	3063	4.01
4.68	3724	1224	4948	1862	3086	4.04
4.77	3795	1224	5019	1897	3121	4.10
4.88	3864	1224	5088	1932	3156	4.16
4.97	3935	1224	5159	1967	3191	4.21
5.07	4004	1224	5228	2002	3226	4.27
5.17	4049	1224	5273	2024	3248	4.31
5.25	4119	1224	5343	2059	3283	4.37
5.35	4164	1224	5388	2082	3306	4.40

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

Phase 1

Number: **M00399-003**

Confining Stress = 1224 (psf)

Sample: **GVDA**

Depth: **15.5-18 feet**

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Axial strain, $\epsilon$ (%)	$\sigma_d$ ( $\sigma_1 - \sigma_3$ ) (psf)	Total $\sigma_3$ (psf)	Total $\sigma_1$ (psf)	$Q = s_u$ ( $\sigma_1 - \sigma_3$ )/2 (psf)	$P$ ( $\sigma_1 + \sigma_3$ )/2 (psf)	$\sigma_1/\sigma_3$
5.47	4207	1224	5431	2104	3328	4.44
5.55	4277	1224	5501	2139	3363	4.49
5.65	4346	1224	5570	2173	3397	4.55
5.75	4390	1224	5614	2195	3419	4.59
5.85	4458	1224	5682	2229	3453	4.64
5.95	4502	1224	5726	2251	3475	4.68
6.07	4570	1224	5794	2285	3509	4.73
6.17	4613	1224	5837	2307	3531	4.77
6.27	4657	1224	5881	2328	3552	4.80
6.37	4725	1224	5949	2362	3586	4.86
6.47	4768	1224	5992	2384	3608	4.90
6.58	4810	1224	6034	2405	3629	4.93
6.67	4879	1224	6103	2439	3663	4.99
6.75	4440	1224	5664	2220	3444	4.63
6.65	2754	1224	3978	1377	2601	3.25
6.57	2007	1224	3231	1003	2227	2.64
6.48	1791	1224	3015	895	2119	2.46
6.40	1332	1224	2556	666	1890	2.09
6.30	824	1224	2048	412	1636	1.67
6.20	510	1224	1734	255	1479	1.42
6.10	316	1224	1540	158	1382	1.26
5.98	170	1224	1394	85	1309	1.14

**Multi-Staged Triaxial Test**  
**Unconsolidated Undrained (UU)**



Project: **BYU (Dr. Youd)**  
 Number: **M00399-003**  
 Sample: **GVDA**  
 Depth: **15.5-18 feet**

Phase 2  
 Confining Stress = 2448 (psf)

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Axial strain, $\epsilon$ (%)	$\sigma_d$ ( $\sigma_1 - \sigma_3$ ) (psf)	Total $\sigma_3$ (psf)	Total $\sigma_1$ (psf)	Q = $s_u$ ( $(\sigma_1 - \sigma_3)/2$ ) (psf)	P ( $(\sigma_1 + \sigma_3)/2$ ) (psf)	$\sigma_1/\sigma_3$
5.98	0	2448	2448	0	2448	1.00
6.02	316	2448	2764	158	2606	1.13
6.11	875	2448	3323	437	2885	1.36
6.21	1335	2448	3783	667	3115	1.55
6.30	1601	2448	4049	800	3248	1.65
6.41	1793	2448	4241	896	3344	1.73
6.50	2178	2448	4626	1089	3537	1.89
6.60	2635	2448	5083	1318	3766	2.08
6.71	3116	2448	5564	1558	4006	2.27
6.82	3546	2448	5994	1773	4221	2.45
6.92	3832	2448	6280	1916	4364	2.57
7.03	4068	2448	6516	2034	4482	2.66
7.14	4256	2448	6704	2128	4576	2.74
7.24	4396	2448	6844	2198	4646	2.80
7.35	4511	2448	6959	2256	4704	2.84
7.45	4602	2448	7050	2301	4749	2.88
7.56	4693	2448	7141	2347	4795	2.92
7.67	4784	2448	7232	2392	4840	2.95
7.77	4850	2448	7298	2425	4873	2.98
7.86	4917	2448	7365	2459	4907	3.01
7.99	5007	2448	7455	2503	4951	3.05
8.08	5050	2448	7498	2525	4973	3.06
8.18	5116	2448	7564	2558	5006	3.09
8.29	5181	2448	7629	2591	5039	3.12
8.39	5223	2448	7671	2612	5060	3.13
8.50	5289	2448	7737	2644	5092	3.16
8.61	5330	2448	7778	2665	5113	3.18
8.70	5396	2448	7844	2698	5146	3.20
8.80	5438	2448	7886	2719	5167	3.22
8.91	5503	2448	7951	2751	5199	3.25
9.01	5544	2448	7992	2772	5220	3.26
9.12	5585	2448	8033	2792	5240	3.28
9.09	4055	2448	6503	2027	4475	2.66
9.00	2548	2448	4996	1274	3722	2.04
8.77	1395	2448	3843	698	3146	1.57
8.43	190	2448	2638	95	2543	1.08
8.11	-167	2448	2281	-83	2365	0.93
8.04	-119	2448	2329	-60	2388	0.95
8.04	-95	2448	2353	-48	2400	0.96

**Multi-Staged Triaxial Test**  
**Unconsolidated Undrained (UU)**



Project: **BYU (Dr. Youd)**  
 Number: **M00399-003**  
 Sample: **GVDA**  
 Depth: **15.5-18 feet**

Phase 3  
 Confining Stress = 4262 (psf)

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Axial strain, $\epsilon$ (%)	$\sigma_d$ ( $\sigma_1 - \sigma_3$ ) (psf)	Total $\sigma_3$ (psf)	Total $\sigma_1$ (psf)	Q = $s_u$ ( $\sigma_1 - \sigma_3$ )/2 (psf)	P ( $\sigma_1 + \sigma_3$ )/2 (psf)	$\sigma_1/\sigma_3$
8.04	-238	4262	4024	-119	4143	0.94
8.04	-71	4262	4191	-36	4227	0.98
8.12	429	4262	4691	214	4477	1.10
8.25	808	4262	5071	404	4667	1.19
8.37	1116	4262	5379	558	4821	1.26
8.46	1352	4262	5615	676	4939	1.32
8.56	1517	4262	5779	759	5021	1.36
8.66	1752	4262	6015	876	5139	1.41
8.77	2058	4262	6320	1029	5291	1.48
8.87	2434	4262	6696	1217	5479	1.57
8.98	2856	4262	7118	1428	5690	1.67
9.10	3277	4262	7539	1638	5901	1.77
9.22	3697	4262	7959	1848	6111	1.87
9.31	4023	4262	8285	2011	6274	1.94
9.43	4347	4262	8609	2173	6436	2.02
9.54	4577	4262	8839	2288	6551	2.07
9.66	4782	4262	9045	2391	6653	2.12
9.77	4940	4262	9203	2470	6733	2.16
9.89	5098	4262	9361	2549	6812	2.20
10.01	5209	4262	9472	2605	6867	2.22
10.14	5319	4262	9581	2659	6922	2.25
10.26	5429	4262	9691	2714	6977	2.27
10.37	5515	4262	9778	2758	7020	2.29
10.49	5602	4262	9864	2801	7063	2.31
10.60	5665	4262	9927	2832	7095	2.33
10.72	5751	4262	10013	2875	7138	2.35
10.83	5790	4262	10053	2895	7158	2.36
10.95	5876	4262	10138	2938	7200	2.38
11.07	5915	4262	10178	2958	7220	2.39
11.18	5977	4262	10240	2989	7251	2.40
11.30	6016	4262	10279	3008	7271	2.41
11.41	6078	4262	10341	3039	7302	2.43
11.53	6117	4262	10379	3059	7321	2.44
11.64	6179	4262	10441	3089	7352	2.45
11.74	6218	4262	10481	3109	7372	2.46
11.86	6280	4262	10542	3140	7402	2.47
11.97	6318	4262	10580	3159	7421	2.48
12.09	6356	4262	10618	3178	7440	2.49
12.20	6394	4262	10656	3197	7459	2.50
12.32	6455	4262	10717	3227	7490	2.51
12.42	6494	4262	10756	3247	7509	2.52
12.53	6531	4262	10794	3266	7528	2.53
12.63	6570	4262	10833	3285	7548	2.54
12.74	6585	4262	10847	3293	7555	2.54
12.86	6645	4262	10907	3323	7585	2.56
12.97	6682	4262	10945	3341	7604	2.57
13.09	6719	4262	10982	3360	7622	2.58
13.21	6734	4262	10996	3367	7629	2.58
13.32	6771	4262	11033	3385	7648	2.59
13.44	6808	4262	11070	3404	7666	2.60
13.55	6844	4262	11107	3422	7685	2.61
13.67	6881	4262	11143	3440	7703	2.61
13.78	6917	4262	11180	3459	7721	2.62
13.90	6931	4262	11194	3466	7728	2.63
14.03	6966	4262	11229	3483	7745	2.63
14.15	7002	4262	11265	3501	7764	2.64
14.27	7016	4262	11278	3508	7770	2.65
14.38	7052	4262	11314	3526	7788	2.65
14.50	7088	4262	11350	3544	7806	2.66
14.61	7124	4262	11386	3562	7824	2.67
14.73	7137	4262	11399	3569	7831	2.67
14.84	7173	4262	11435	3586	7849	2.68
14.96	7186	4262	11448	3593	7855	2.69
15.08	7221	4262	11484	3611	7873	2.69
15.19	7234	4262	11497	3617	7880	2.70
15.31	7270	4262	11532	3635	7897	2.71
15.42	7305	4262	11567	3652	7915	2.71

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

[Phase 3](#)

Number: **M00399-003**

Confining Stress = 4262 (psf)

Sample: **GVDA**

Depth: **15.5-18 feet**

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Axial strain, $\epsilon$ (%)	$\sigma_d$ ( $\sigma_1 - \sigma_3$ ) (psf)	Total $\sigma_3$ (psf)	Total $\sigma_1$ (psf)	$Q = s_u$ ( $\sigma_1 - \sigma_3$ )/2 (psf)	$P$ ( $\sigma_1 + \sigma_3$ )/2 (psf)	$\sigma_1/\sigma_3$
15.54	7318	4262	11580	3659	7921	2.72
15.63	7354	4262	11616	3677	7939	2.73
15.77	7365	4262	11628	3683	7945	2.73
15.87	7401	4262	11664	3701	7963	2.74
15.98	7436	4262	11698	3718	7980	2.74
16.08	7428	4262	11691	3714	7977	2.74
16.19	7463	4262	11725	3731	7994	2.75
16.31	7475	4262	11738	3738	8000	2.75
16.41	7511	4262	11773	3755	8018	2.76
16.52	7283	4262	11546	3642	7904	2.71