Laboratory test data

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Map unit	Field stations [1]	Atterberg limits [2]			pH value	Median particle size (microns)	Unified soil classification symbol [3] (based on laboratory data)	Activity [4]	Compressive strength [5] (tons per sq ft)		Consolidation [6]		Potential-volume-change swell index (lb per sq ft) [7]		Compaction test [8]		Field bulk density (lb per cu ft)	Frost susceptibility (L, low; M, medium; H, high)	Moisture content (percent)	Infiltration [9] (inches of water level drop in 30 minutes)	Mineralogic compositions determined by X-ray analyses [10]													
																					Minerals present in quantities not less than 3 percent (figures represent quantities to the nearest 5 percent)							Clay-mineral composition (letters denote relative order of abundance)						
		Liquid	Plastic	Plasticity index					Disturbed	Remolded	Percent	Coefficient of consolidation (sq in. per day)	Remolded	Undisturbed	Optimum moisture content (percent)	Maximum dry density (lb per cu ft)					Quartz	Feldspar	Calcite	Dolomite	Iron-magnesium minerals	Clay	Other	Mixed layer	Illite and mica	Kaolinite	Chlorite	Vermiculite	12.3A mineral	Montmorillonite
Mc	9	26	22	4	5.22	17	ML-CL	0.24	*48.3	*4.0					16.0	111.2	106.7	M-H	7.4	0.40	45	20	0	0	0	35	0	A	B	B			C	
	17	19	13	6	7.15	26	CL-ML	.40					700	250			107.2	M-H	2.3		50	10	0	5	5	25	0	A	B	C		DE	DE	
	18	33	23	10	4.50	17	CL-ML	.49	>5.0	*6.5	9.0	158.3	550	250	18.0	109.2	109.3	M-H	17.6		40	10	0	0	0	40	5	A	B	C			D	
	19	33	24	9	4.35	14	ML-CL	.50	4.5		11.6	154.5	1,150	250	18.0	108.2	119.1	M-H	19.0		40	15	0	0	0	40	0	B	A	C			D	
	20	22	18	4	5.62	18	CL	.25					400					M-H			40	15	0	0	0	45	0	A	B	C			D	
	23	38	24	14	4.83	15	CL-ML	.64					550				103.7	M-H	7.6		40	15	0	0	0	40	0	C		B		A	D	
	37	42	21	21	4.50	12	CL	.72					2,250					M-H			40	10	0	0	0	50	0	A	C	B		D		
	3	31	19	12	4.81	18	CL	.44	2.3	*3.3	18.0	150.0	1,300	250	16.7	111.3	102.9	H-H	17.6		45	10	0	0	0	40	0	D	C	B		A	E	
	8	42	30	12	4.52	8	ML	.30	>5.0									M-H	12.2	2.23	35	5	0	0	0	50	10	A	C	B		C	D	
	10																				40	15	0	0	0	40	0	A	A	C		D	E	
	11	29	19	10	7.60	20	CL	.59	4.0	*5.0	10.4	153.6	700	250	15.0	112.1	107.0	M-H	23.9	.33	40	15	0	0	0	40	5	A	B	C		D		
	12	28	20	8	8.11	15	CL	.34			11.2	147.7	400	250				M-H			35	15	<5	<5	<5	40	0	C	A	B		D	E	
	26	30	21	9	5.31	16	CL-ML	.64	2.0				3,000				113.3	M-H	24.1		45	10	0	0	0	40	0	A	B	C		D		
	27	35	24	11	7.22	7	ML-CL	.32										M-H																
	28	44	24	20	4.39	7	ML	.54	1.0				1,150					M-H			35	10	0	0	0	55	0	A	D	B		C		
	29	34	23	11	6.53	14	ML-CL	.37					1,000					M-H			30	5	0	5	5	40	10	A	B	C		D		
	30	35	25	10	4.50	15	ML-CL	.27					1,600					M-H																
	31	44	26	18	4.20	5	ML-CL	.44					2,300					M-H																
	32	30	22	8	6.50	18	ML-CL	.32	>5.0				1,700				121.7	M-H	13.4		30	10	0	0	0	60	0	A	B	C			D	
	33	25	20	5	7.78	19	CL-ML	.20	>5.0				850					M-H																
	34	24	18	6	6.22	29	CL	.40	>5.0				850					M-H																
	2-10												400																					
	2-20																121.6																	
	2-30	27	17	10	7.58	17	CL	.40	.25								120.6	M-H	27.3		40	15	0	0	0	40	5	B	A	C			D	
	2-40	28	18	10	7.63	26	CL	.41	.50								122.8	M-H	25.4		35	10	0	0	0	45	0	B	A	C			D	
	2-50	33	16	17	8.02	14	CL	.52	1.00								126.7	M-H	23.6		30	10	0	5	0	55	0	B	A	C			D	
	2-60	46	24	22	7.04	5	CL	.59	.25								115.5	M-H	37.2		35	10	0	0	0	55	0	BC	A	BC	D			
	2-70	45	25	20	7.32	4	CL-ML	.47	.50								115.1	M-H	36.3		30	10	0	0	0	55	0	C	A	B	D			
	4-10	27	24	3	7.11	33	ML	.17	1.25				400				124.7	M-H	24.3		40	10	<5	<5	5	35	0	B	A	C		E	D	
	4-20	27	20	7	8.18	15	CL-ML	.28	.25								119.0	M-H	19.7		40	15	<5	<5	0	40	0	B	A	C			D	
	4-30	34	23	11	7.63	5	CL-ML	.29	1.75								127.1	M-H	21.8		25	10	5	10	0	45	0	B	A	C	DE		DE	
	4-40	36	22	14	7.61	3	CL-ML	.33	1.75								123.3	M-H	23.2		30	10	5	15	0	40	0	C	A	B	D			
	4-50	26	19	7	7.60	21	CL-ML	.39	.25								124.9	M-H	24.2		30	10	0	0	5	40	15	B	A	C				
	4-60	31	21	10	7.45	14	ML-CL	.44	.25								121.7	M-H	28.7		45	10	0	0	0	45	0	A	C	B				
	5-10	28	23	5	6.59	28	ML-CL	.24					1,150					M-H																
	5-20	29	23	6	7.80	13	ML-CL	.22	.25								121.0	M-H	27.0		35	10	0	10	0	45	0	A	B	C			D	
	5-30	31	21	10	7.77	9	CL-ML	.35	1.50				2,000				130.0	M-H	21.1		25	15	5	10	0	40	0	A	B	C				
	5-40	35	8	27	7.88	5	CL	.74	1.50								123.1	M-H	29.0		30	10	5	10	0	45	0	B	A	C	D			
	5-50	38	23	15	7.04	9	CL	.56	.25								123.0	M-H	29.2		35	10	5	0	0	45	0	B	C	A		D		
	5-60	36	18	18	7.29	7	CL	.60	.50								124.9	M-H	28.8		40	10	0	0	0	45	0	A	C	B				
	5-72	21	20	1	7.95	41	ML-CL	.08	1.00								127.0	M-H	20.8		55	10	0	0	0	35	0	A	C	B				
	6-10	32	22	10	8.51	21	CL-ML	.42	1.00				700				122.3	M-H	23.6		40	10	0	0	5	40	0	A	B	C			D	
	6-20	29	19	10	8.36	19	CL	.43	.25								117.3	M-H	24.0		40	10	0	5	0	40	0	C	A	B			D	
	6-30	23	21	2	8.12	27	CL-ML	.10	.25								122.5	M-H	23.4		40	15	0	5	0	40	0	B	A	C			D	
	6-40	33	21	12	7.52	10	CL	.38	.50								122.0	M-H	26.5		35	10	0	0	0	50	0	A	B	C				
	6-50	47	29	18	7.88	4	ML	.12										M-H			30	10	0	0	0	60	0	A	C	B			D	
	6-55				7.02	3	CL	.18	.25	*.23							127.6	M-H	22.9		40	10	0	0	0	50	0	BC	A	BC			C	
	7-10	30	19	11	8.02	15	CL	.41					850				117.3	M-H	13.2		45	10	5	0	0	40	0	A	B	C			D	
	7-20	24	20	4	8.03	17	CL-ML	.17	.75				700				128.0	M-H	19.3															
	7-25	25	16	9	8.02	23	CL	.41	1.25								126.5	M-H	15.2		45	15	0	5	0	30	0	B	A	C				
	10-10	29	22	7	5.41	56	ML-CL	.47					250				132.2	M-H	21.2		40	15	0	0	0	40	0	B	A	C		D	E	
	10-20	27	17	10	5.49	30	CL	.53					400				124.8	M-H	18.8															
	10-35	25	16	9	5.82	37	CL	.51	.50								123.8	M-H	20.9															
	10-55					25	SP											L																
	36-10	37	24	13	6.78	11	CL	.42										M-H																
	36-20	42	29	13	6.40	11	ML	.40										M-H																
	36-30	36	25	11	4.59	12	CL-ML	.35										M-H																
S	22	34	17	17	4.22	26		1.13																										
	24					106																												
	25					460																												
Cp	13	109	70	39	3.80	4		.96			3.8	70.4	18,500	2,700			99.3		61.3		10	10	0	0	0	70	10		C	B				A
	14	62	37	25	3.59	16		1.00	*9.53		5.2	150.0	9,750	400																				
	15	99	68	31	3.78	18		1.35			8.0	70.4	16,100	1,900																				
	35-20	129	77	52	4.52			.67																										
	21	40	25	15	3.70	80		.27	>5.0		7.5	154.7	700	250	22.0	99.3	95.8		24.3	.29	35	5	0	0	0	40	15	C	A	B				
SCM	1					13					15.0	153.6	1,750				99.8		28.1		40	5	0	0	0	50	0	C	A	B				
	2-120	39	24	15	5.88	15		.75	.50				3,550				120.3		25.8		50	5	0	0	0	50	0	C	A	B				
	4-118	50	26	24	6.52	7		.71									121.0		24.2		45	5	0	0	0	45	5	C	A	B				
	6-108	45	24	21	6.60	7		.58	1.50								123.8		23.1															
	7-47	45	21	24	3.44	10		1.41	.75								116.3		26.0															
	14	58	39	19	2.18	19		1.23			12.0		3,700	850			99.8		36.6	.23														
	16	43	26	17	2.64	19		.89					1,300	250	18.0	105.2	109.0		26.8	.33	50	5	5	0	0	40	0	C	A	B				

[1] Hyphenated numbers refer to field stations and depth below surface at which samples were taken; other numbers refer to field stations at which near-surface samples were taken.

[2] As described in American Society for Testing Materials designations D423–54T and D424–54T, in "Procedures for Testing Soils" (American Society for Testing Materials, 1964, p. 85–87, 109–112).

[3] As described in U.S. Bureau of Reclamation "Earth Manual" (1963, p. 15–18).

[4] Skempton's activity series is described in the accompanying section on tests.

[5] Unconfined compressive strength determined in most cases by pocket penetrometer. Asterisk (*) denotes values determined by unconfined compression test. Disturbed samples were tested at field-moisture content. Remolded samples were tested with near-optimum moisture content.

[6] Tests were performed on undisturbed samples 0.625 inch thick at field moisture content. Tests were based on method described by Holtz and Gibbs (1958).

[7] Disturbed samples were tested at "dry relative water content" according to procedures described by Lambe (1960). Undisturbed field samples were tested in same apparatus used for disturbed samples.

[8] Moisture density tests were run by Harvard Miniature method (Wilson, American Society for Testing Materials, 1964, p. 160–162) using a tamper adjusted for 40-lb compactive effort.

[9] As described by McQueen (1963, p. 1). A column of water, contained by a plastic cylinder, was allowed to percolate into the ground surface for a period of 30 minutes. The water-level fall is recorded as infiltration. Shallow subsurface tests done in 1963 by R. L. Bailey, Symsonia, Ky. (oral commun., 1963), show the following percolation data:

Hole number	2	3	4	4	5	6	8	9	10	12	13	13	17
Percolation (in.)	1⅝	1 15/16	1 5/16	1⅞	1 5/16	2.0	1¼	1 5/16	1 5/16	1¼	3 1/16	⅝	1 19/32

Four test holes, 30 inches deep, at each location were filled with water to within 6 inches from the surface. Water was added each hour for 4 hours, and the average loss of water at the end of each hour was recorded as percolation rates.

[10] Minerals present in small quantities not reported. Mixed-layer clays consist predominantly of calcium montmorillonite and vermiculite.