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United States
Department of
Agriculture

Soil
Conservation
Service

Klaus W. Flach
Special Asst. Science & Technlgy.
SCS, Washington, DC

Midwest National Technical Center
Soil Mechanics Laboratory
512 South 7th Street
Lincoln, NE 68508-2919

Subject: WEPP - 1987 Cropland Samples -
Soil Mechanics Tests

Date: September 7, 1988

To: John M. Lafren, Research Leader
~~Natl. Soil Erosion Research Laboratory~~
ARS, West Lafayette, IN

File code: 210-22

U.S.D.A., NAL
MAY 04 2005
CATALOGING PREP

Eighteen samples were sent to the SCS Soil Mechanics Laboratory at Lincoln, Nebraska, for soil mechanics tests. The samples were collected during the summer of 1987.

The tests that we were scheduled to make are as follows:

1. Atterberg limits
2. Middleton dispersion ratio (modification)
3. Unconfined compressive strength
4. Direct shear at low confining pressure
5. Consolidation tests with permeability measurements
6. Pinhole test for dispersion/erodibility

The samples tested are listed on the attached form SCS-ENG-354 (Attachment A). The Atterberg limit test data are recorded on the attached forms SCS-ENG-354.

The Middleton dispersion ratio along with the SCS percent dispersion values are recorded on the attached form SCS-ENG-354 (Attachment A).

The Middleton dispersion ratio from USDA Technical Bulletin No. 178, "Properties of Soil Which Influence Soil Erosion" by H. E. Middleton is defined as the ratio, expressed in percentage, of silt and clay to the total silt and clay obtained by mechanical analyses. The gradation data for the samples are recorded on the attached form SCS-ENG-354. The size range finer than the No. 200 sieve (0.074 mm) was determined by hydrometer. The first line entry for each sample represents the total size fraction determined with a standard hydrometer analyses test using a chemical dispersing agent. The second line entry for each sample represents the size fraction by hydrometer analyses without a dispersing agent added. Refer to ASTM D4221 "Dispersive Characteristics of Clay Soil by Double Hydrometer" for the test procedure.

The entries in the percent dispersion column on the attached form SCS-ENG-354 are for the double hydrometer procedure (ASTM D4221). The column labeled



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* U.S. Government Printing Office: 1988-529-568/30577

John M. Laflen

2

Middleton dispersion ratio is the percent passing 0.05 mm for the second line entry divided by the total percent passing 0.05 mm (first line entry).

The specific gravity of the solid fraction finer than the No. 10 size is recorded for each sample on the attached form SCS-ENG-354.

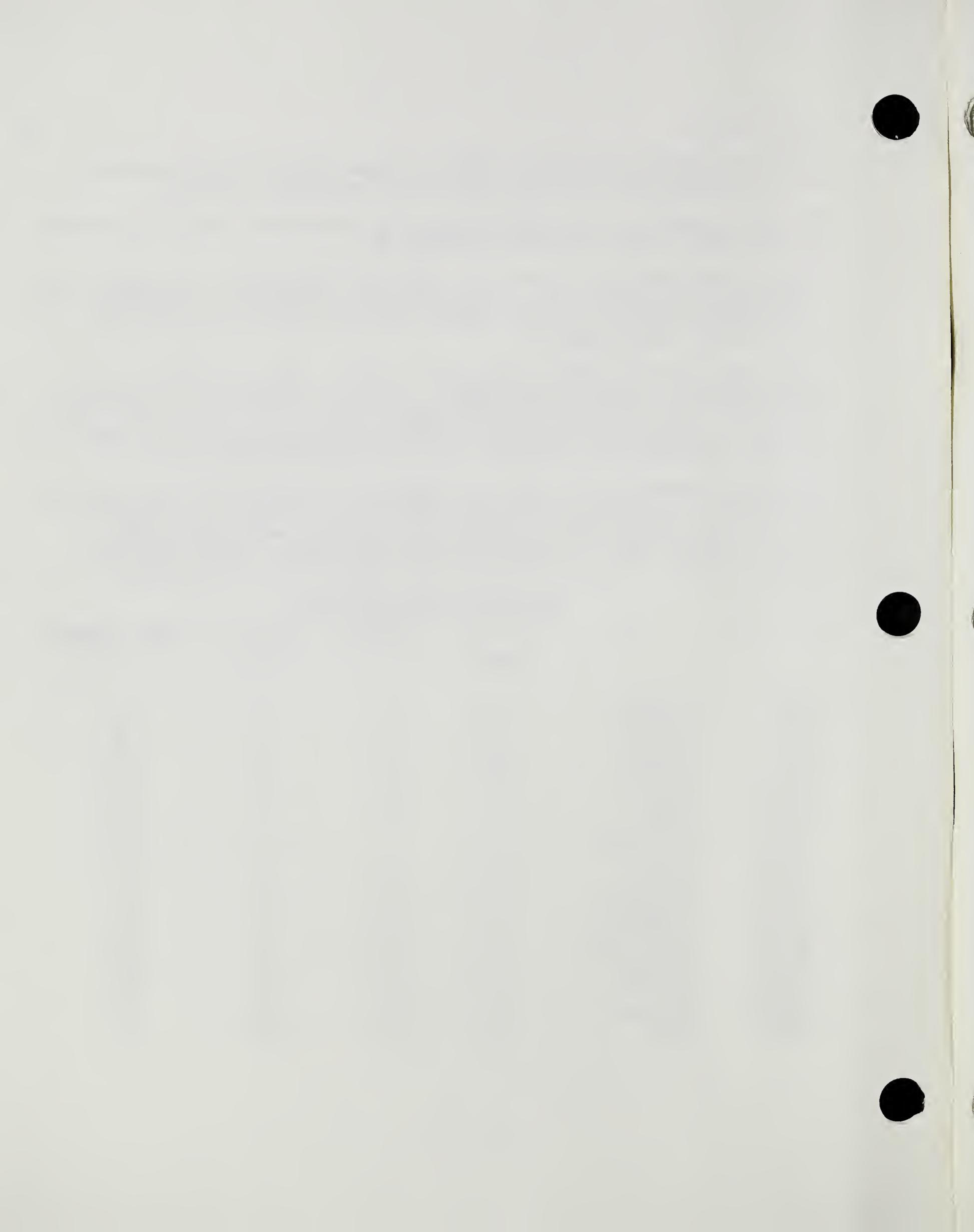
Prior to making tests for direct shear, unconfined compression, consolidation with permeability, and pinhole tests it was necessary to determine a test density. In discussion with John Laflen we agreed to make the tests at the after rain density listed in Attachment B.

Direct shear tests were made on each of the samples. The test density was the after rain density listed in Attachment B. The test specimens were flooded prior to testing. The tests were made at low normal loads of 2, 4, and 6 lb/in². The shear test parameters obtained represent the consolidated drained conditions. The data are reported in attachment C and are summarized in Attachment A.

Unconfined compression tests were made on each of the samples. The test specimens were molded to the after rain density. They were placed in a rubber membrane in a triaxial cell and water was percolated through the specimens for about 16 hours to saturate them. Following the saturation process, the specimens were loaded to failure. The test data are in Attachment D and are summarized as follows:

Unconfined Compression Tests

Sample No.	Soil	Test γ_d g/cm ³	W After Test %	Strain @ Failure %	Shear Strength c, lb/ft ²
88C89	Abilene	1.50	16.5	1.3	190
88C90	Academy	1.61	17.0	1.7	180
88C91	Barnes	1.14	26.6	1.0	190
88C92	Barnes	1.20	31.8	2.0	215
88C93	Heiden	0.99	36.5	5.0	250
88C94	Hirsh	1.43	19.7	1.3	135
88C95	Keith	1.32	28.2	2.0	230
88C96	Los Banos	1.0		11.0	280
88C97	Pierre	1.05	39.6	4.0	350
88C98	Palouse	1.15	31.3	6.0	285
88C99	Portneuf	1.25	31.7	4.0	315
88C100	Sharpsburg	1.14	35.8	4.0	225
88C101	Sverdrup	1.46	20.3	1.5	190
88C102	Walla Walla	1.25	32.6	2.0	280
88C103	Whitney	1.54	15.6	2.0	200
88C104	Williams	1.16	29.0	1.0	190
88C105	Woodward	1.41	25.0	2.0	260
88C106	Zahl	1.25	27.5	3.0	240

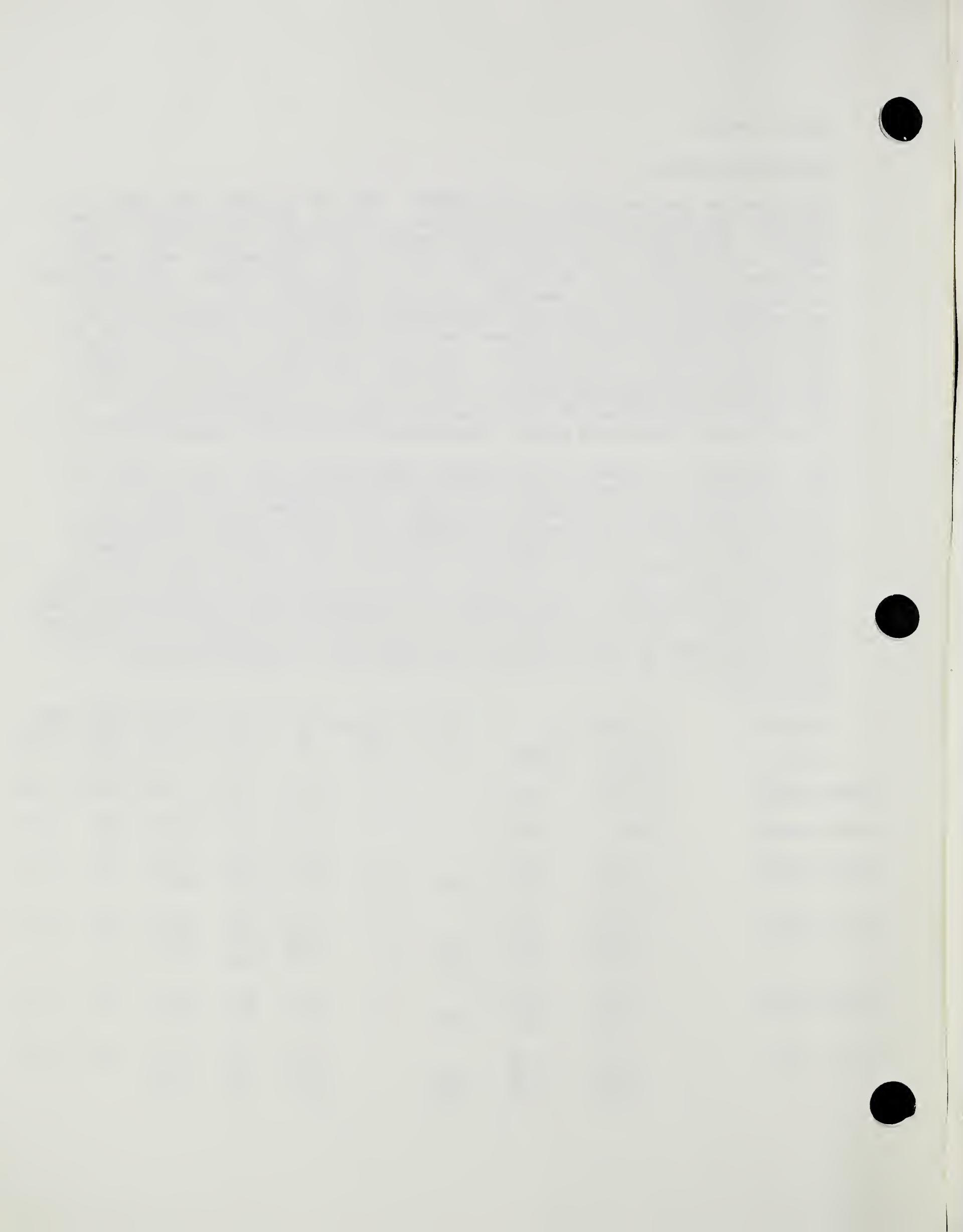


Consolidation Tests

Consolidation tests were made on all samples. The test specimens were made to the after rain density in the consolidometer. Prior to loading, the samples were flooded. The first test on each sample was made by loading to 500 lb/ft², 1,000 lb/ft², 2,000 lb/ft², 4,000 lb/ft², and 8,000 lb/ft². Permeability measurements were made at 2,000 lb/ft², 4,000 lb/ft², and at 8,000 lb/ft² loads. When we looked at the consolidation and permeability test data from these tests, we found that the permeability versus void ratio relationship could not be projected back to estimate the permeability at placement void ratio because too much volume change had occurred on most of the samples. Additional tests were then made in which the loading sequence was 100 lb/ft², 500 lb/ft², 1,000 lb/ft², and 2,000 lb/ft² with permeability measurements made at each load. The consolidation test data are reported in Attachment E. The data are reported as void ratio versus consolidating pressure and percent consolidation versus consolidating pressure.

The following is a summary of the percent consolidation versus load. Eleven of the 18 samples were tested twice. The first test was made with the loading sequence started at 0.5 ksf and with doubling load increments thru 8 ksf. The second test was made with the load starting at 0.1 ksf and with load increments thru 2 ksf. For 6 of the 11 samples on which two tests were made, the percent consolidation versus load for the .5, 1.0, and 2.0 ksf loads were very close to the same. On the other 5 of 11 samples where two tests were made there were some fairly large differences in the amount of consolidation under the same load between the two tests. The same procedure was used to prepare the specimens for each test and the test density was very close to the same so the difference is likely due to different size of voids in the two specimens due to slightly different aggregation.

Sample No.	Test lb/ft ³	γ_d g/cm ³	Percent Consolidation Under These Loads (ksf)					
			.1	.25	.5	1.0	2.0	4.0
88C89 Abilene	93.6	1.50			6.04	7.55	9.33	10.98
88C90 Academy	100	1.60			8.55	10.9	12.9	15.1
88C91 Barnes	71.7	1.15			20.3	24.6	27.9	31.3
	71.2	1.14	12.4	17.9	21.0	24.5	27.8	34.8
88C92 Barnes	75.0	1.20			8.2	12.5	16.8	19.5
	74.9	1.20	4.2		14.0	17.9	22.1	24.5
	74.9	1.20	6.2		13.2	18.0	21.7	
88C93 Heiden	61.9	0.99			19.3	25.6	31.2	35.5
	61.8	0.99	2.0		15.9	22.8	28.5	39.1
88C94 Hirsh	86.7	1.39			12.0	13.6	15.2	16.7
	86.8	1.39	11.6		15.4	17.6	19.2	18.1
	86.8	1.39	17.0		20.0	21.4	22.7	

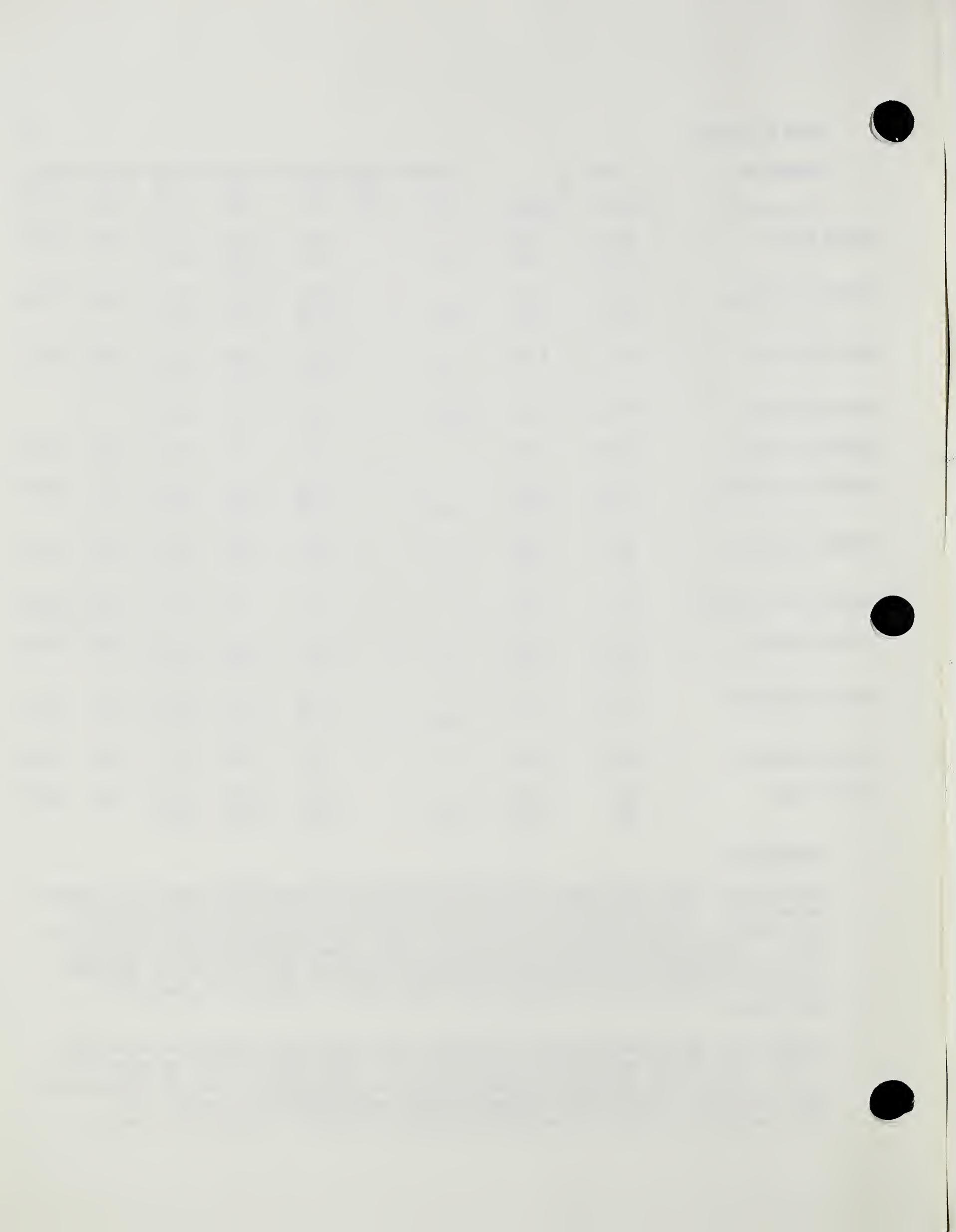


Sample No.	Test lb/ft ³	γ_d g/cm ³	Percent Consolidation Under These Loads (ksf)							
			.1	.25	.5	1.0	2.0	4.0	8.0	
88C95 Keith	82.4	1.32			8.3	12.5	15.9	18.9	22.2	
	82.4	1.32	-.5		6.7	10.9	14.7			
88C96 Los Banos	62.4	1.0			22.3	25.7	30.5	34.8	39.0	
	62.4	1.0	9.5		22.8	27.4	31.7			
88C97 Pierre	65.6	1.05			12.1	16.4	22.5	28.0	33.1	
			-.6		12.0	18.0	23.2			
88C98 Palouse	71.8	1.15	14.8		21.2	24.0	26.8			
88C99 Portneuf	78.0	1.25			4.3	7.8	11.0	14.6	18.3	
88C100 Sharpsburg	71.2	1.14			8.9	13.5	17.9	22.1	26.7	
	71.2	1.14	-.05		11.5	16.3	21.0			
88C101 Sverdrup	91.1	1.46			10.1	13.4	16.2	18.3	20.7	
	91.1	1.46	1.3		10.1	13.5	16.6			
88C102 Walla Walla	78.0	1.25			4.4	7.5	10.5	13.6	17.0	
88C103 Whitney	96.1	1.54			13.4	15.1	16.9	18.8	20.9	
	96.1	1.54	-.6		12.5	13.8	15.0			
88C104 Williams	72.4	1.16			17.9	21.9	26.2	29.8	33.4	
			4.9		17.9	22.0	25.5			
88C105 Woodward	88.0	1.41			5.0	8.8	11.7	14.7	17.6	
88C106 Zahl	78	1.25			10.4	15.2	18.6	23.2	27.2	
	78	1.25	5.2		14.8	18.6	21.9			

Permeability

Permeability tests were made on the consolidation test specimens during the consolidation test. The consolidation test specimens were placed at or near the after rain density and flooded prior to the test. Following consolidation under a given load, a falling head permeability test was made. The procedure used is similar to that described in the Canadian Geotechnical Journal, Vol. 20, No. 4, November 1983, "The Permeability of Natural Soft Clays. Part I: Methods of Laboratory Measurement.

Permeability measurements made at different void ratios are plotted as void ratio e versus the log of permeability coefficient k. From this plot the permeability at the initial void ratio of the specimen can be determined. Part II: Permeability Characteristics in the above referenced paper states that the e versus log k relationship are linear for volumetric strains of from 0 - 20% and that beyond



20% a more or less curvature occurs indicating a faster reduction in permeability with void ratio. Eleven of the first consolidation test specimens had more than 20% consolidation so additional test with a lesser loading along with permeability measurements were made to provide the basis for estimating permeability at the after rain density. The e versus log k data are in Attachment F.

The estimated permeability at the after rain density for each of the samples are as follows:

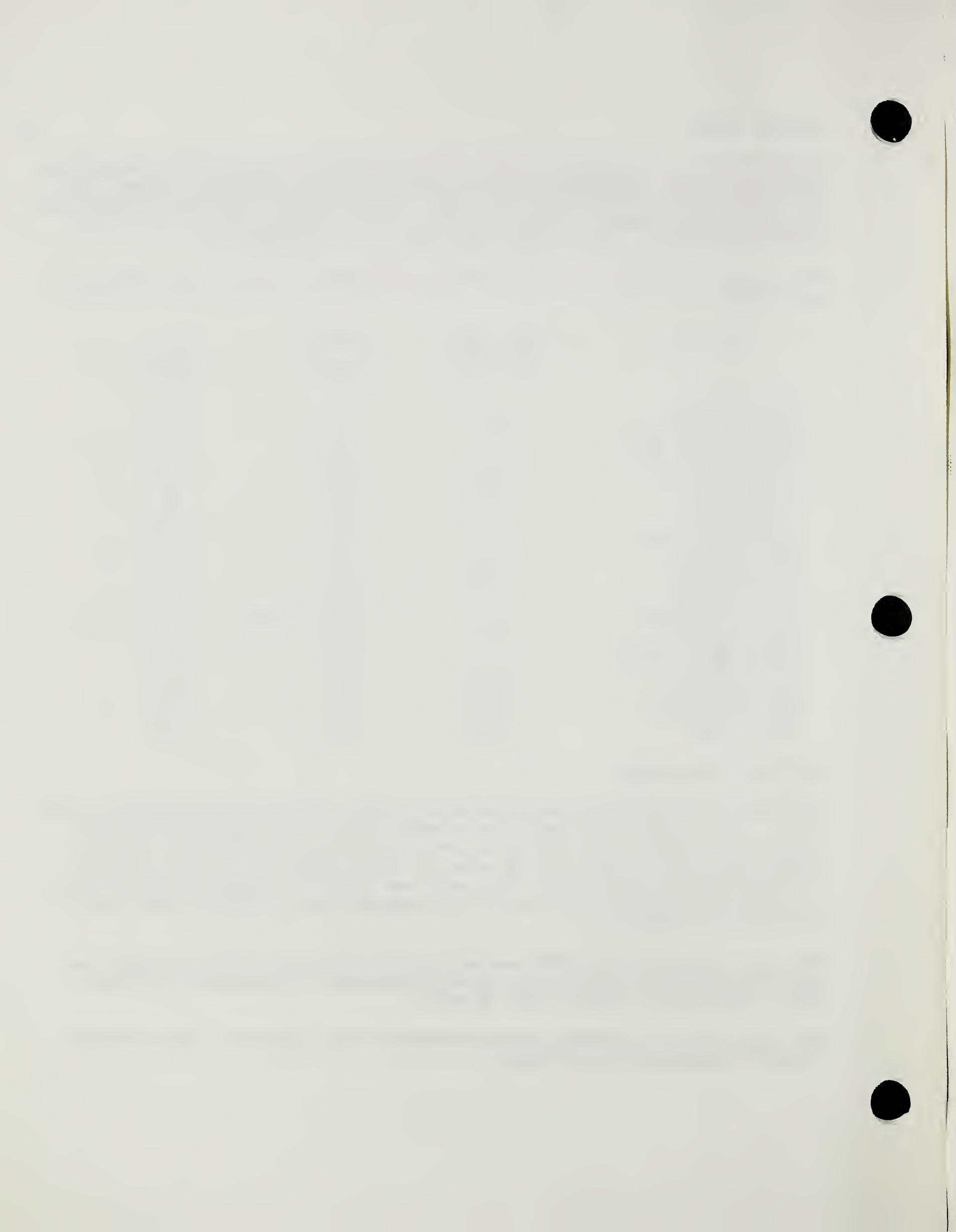
Sample No.	After Rain γ_d , g/cm ³	Test γ_d g/cm ³	k (ft/day)
88C89 Abilene		1.5	15
88C90 Academy	1.61	1.6	0.8
88C91 Barnes, MN		1.15	8
88C92 Barnes, ND	1.20	1.20	3.5
88C93 Heiden	.99	0.99	3
88C94 Hirsh	1.43	1.39	10
88C95 Keith	1.32	1.32	0.6
88C96 Los Banos	1.0	1.0	10
88C97 Pierre	1.05	1.05	1.0
88C98 Palouse	1.15	1.15	1.0
88C99 Portneuf	1.25	1.25	0.3
88C100 Sharpsburg		1.14 (tilled)	6.0
88C101 Sverdrup	1.46	1.46	5.0
88C102 Walla Walla		1.25	0.3
88C103 Whitney	1.54	1.54	0.9
88C104 Williams	1.16	1.16	10.0
88C105 Woodward	1.41	1.41	2.0
88C106 Zahl	1.25	1.25	2.0

Critical Shear Stress

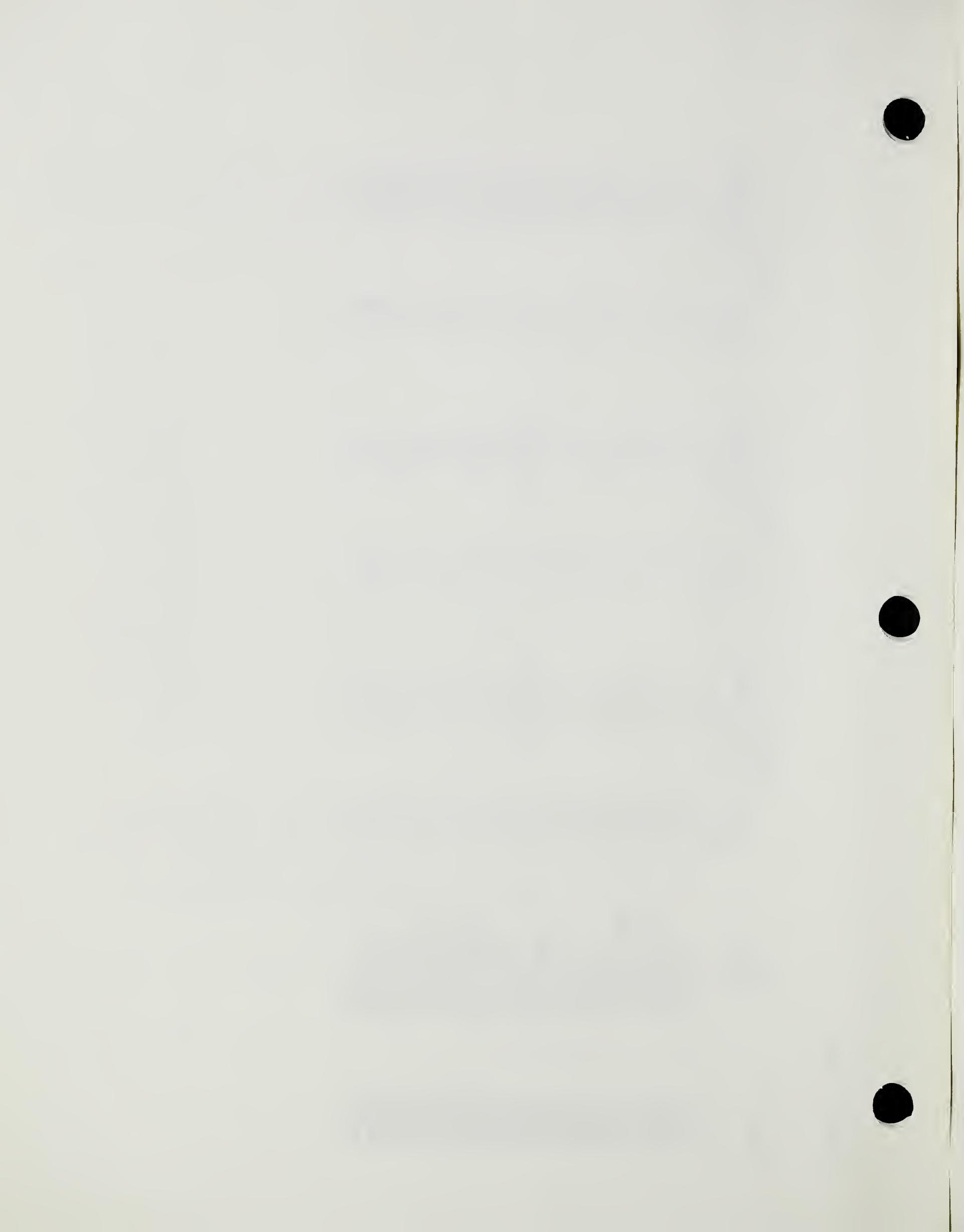
The pinhole test procedure was modified to provide a basis for estimating critical shear. This was done by making flow through quantity measurements starting at a head of $\frac{1}{2}$ inch and then increasing the head slightly in increments. Critical shear stress was assumed to be the point at which erosion of particles started to enlarge the preformed hole. This point was judged by comparing measured rates of flow through under a given head to the computed curve of flow through versus preformed hole diameter.

The first trial for each sample was made at the after rain density and then two more trials were made to determine if we could measure differences in critical shear stress with a change in soil density.

The values of critical shear stress estimated by this method for three different placement densities are as follows:



Sample No.	Soil Series	TRIAL 1			TRIAL 2			TRIAL 3		
		γ_d^d / cm^3	Crit. Shear N/m^2							
88C89	Abilene	1.50	0.94	1.60	1.29	1.70	1.20	1.70	1.20	
88C90	Academy	1.61	4.19	1.60	1.78	1.70	3.47	1.70	3.47	
88C91	Barnes, MN	1.14	12.03	1.05	3.56	1.07	1.01	1.07	1.01	
88C92	Barnes, ND	1.20	2.08	1.05	0.95	1.25	2.94	1.25	2.94	
88C93	Heiden	0.99	10.76	0.85	10.63	0.75	3.46	0.75	3.46	
88C94	Hirsh	1.43	1.16	1.60	0.66	1.70	0.59	1.70	0.59	
88C95	Keith	1.32	0.73	1.40	2.52	1.50	1.89	1.50	1.89	
88C96	Los Banos	1.00	10.52	0.85	7.78	0.75	6.44	0.75	6.44	
88C97	Pierre	1.05	No erosion	0.90	No erosion	0.75	12.84	0.75	12.84	
88C98	Palouse	1.15	12.93	1.00	0.88	1.07	2.27	1.07	2.27	
88C99	Portneuf	1.25	1.45	1.35	2.46	1.50	2.06	1.50	2.06	
88C100	Sharpsburg	1.14	2.86	1.20	6.81	1.10	8.02	1.10	8.02	
88C101	Sverdrup	1.46	4.94	1.55	4.17	1.40	3.18	1.40	3.18	
88C102	Walla Walla	1.25	1.84	1.40	1.00	1.50	4.36	1.50	4.36	
88C103	Whitney	1.54	1.03	1.65	0.71	1.70	3.08	1.70	3.08	
88C104	Williams	1.16	14.15	1.05	12.73	0.90	4.96	0.90	4.96	
88C105	Woodward	1.41	0.92	1.60	1.29	1.70	1.24	1.70	1.24	
88C106	Zahl	1.25	5.19	1.35	7.56	1.15	3.82	1.15	3.82	



Effect of Conductivity of Eroding Water on Critical Shear Stress

Four samples were selected for testing with water that was made up to approximate the conductivity of the water that was used for the field trial. The samples selected were fine grained soils. Three of the samples selected had low values for critical shear stress as determined by the laboratory method presented in this report and one had a fairly high value for critical shear stress. These tests were made at the after rain density.

The comparison of critical shear stress for the two types of eroding water are as follows:

Sample	Critical Shear Stress N/m ²	
	Distilled Water	Field Trial Water Equivalent
Barnes, ND, 88C92	2.08	5.7
Keith, 88C95	0.73	21.3
Los Banos, 88C96	10.5	13.2
Woodward, 88C105	0.92	No erosion

We didn't check the effect of eroding water on any of the nonplastic sandy samples nor more than one of the fine grained soils that showed good erosion resistance because for each of these groups we thought the effect of water conductivity on erosion in this test might be small.

The tests on the Keith soil and the Woodward soil show a significant effect of conductivity of the eroding water on the susceptibility of erosion by this test.

The data sheets for each trial and the explanation of how the conductivity of field trial water was approximated are included in Appendix G.

Lorn P. Dunnigan

LORN P. DUNNIGAN
Head, Soil Mechanics Laboratory

Enclosure

cc: w/encl.

Walter J. Rawls, Hydrologist, Hydrology Laboratory, Beltsville Agricultural Research Center, Beltsville, MD

John Gilley, ARS, University of Nebraska, East Campus, Lincoln, NE

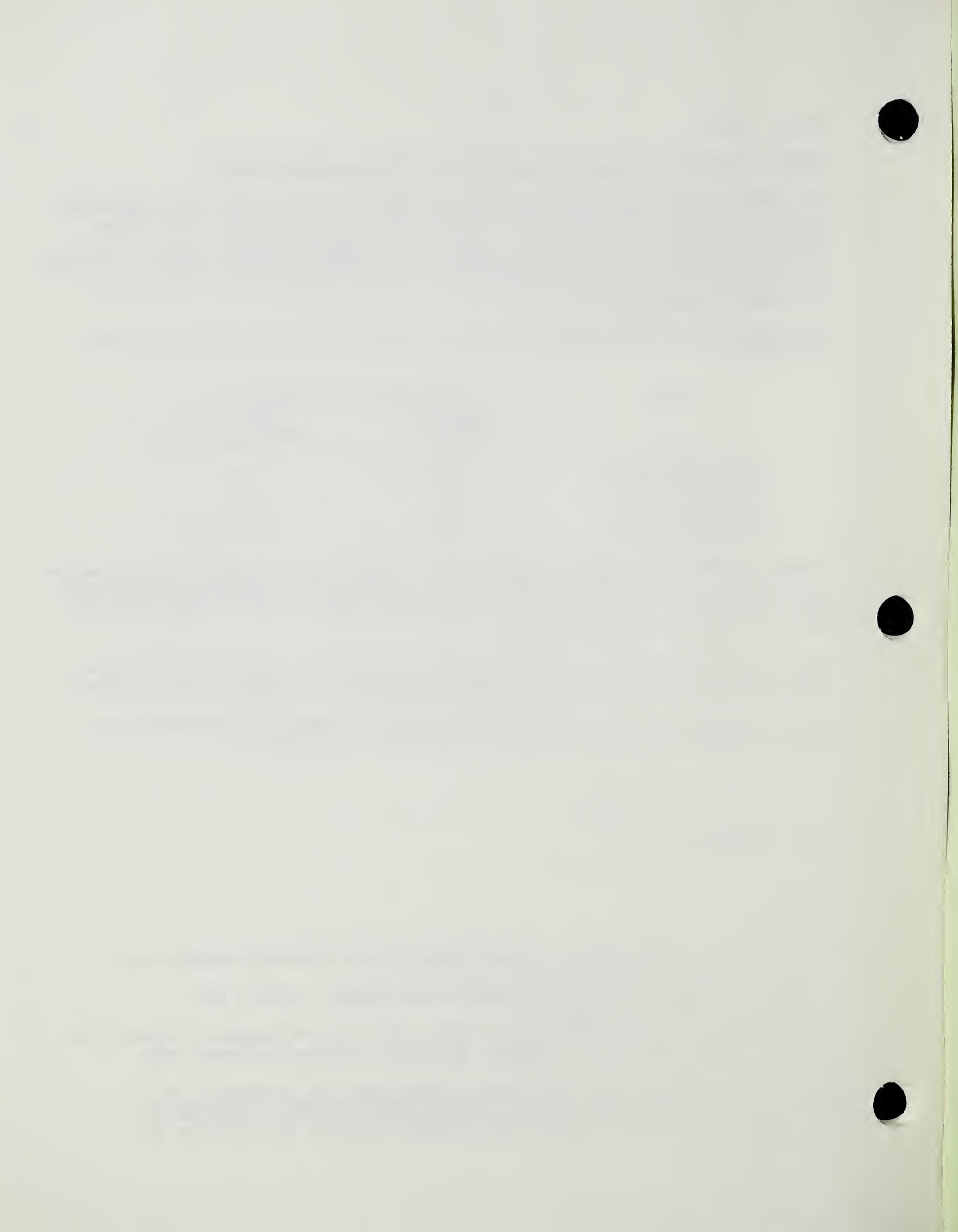
Leonard Lane, ARS, Tucson, AZ

E. Eugene Alberts, Watershed Research Unit, University of Missouri, Columbia, MO
David L. Schertz, National Agronomist, Ecological Sciences Division, SCS,
Washington, DC

Klaus W. Flach, Special Asst. Science & Technology, SCS, Washington, DC

James R. Talbot, Natl. Soil Engineer, Engineering Division, SCS, Washington, DC

C. Steven Holzhey, Asst. Director, Soil Survey Division, SCS, Lincoln, NE



Forms SCS-ENG-354, Soil Mechanics Laboratory Data



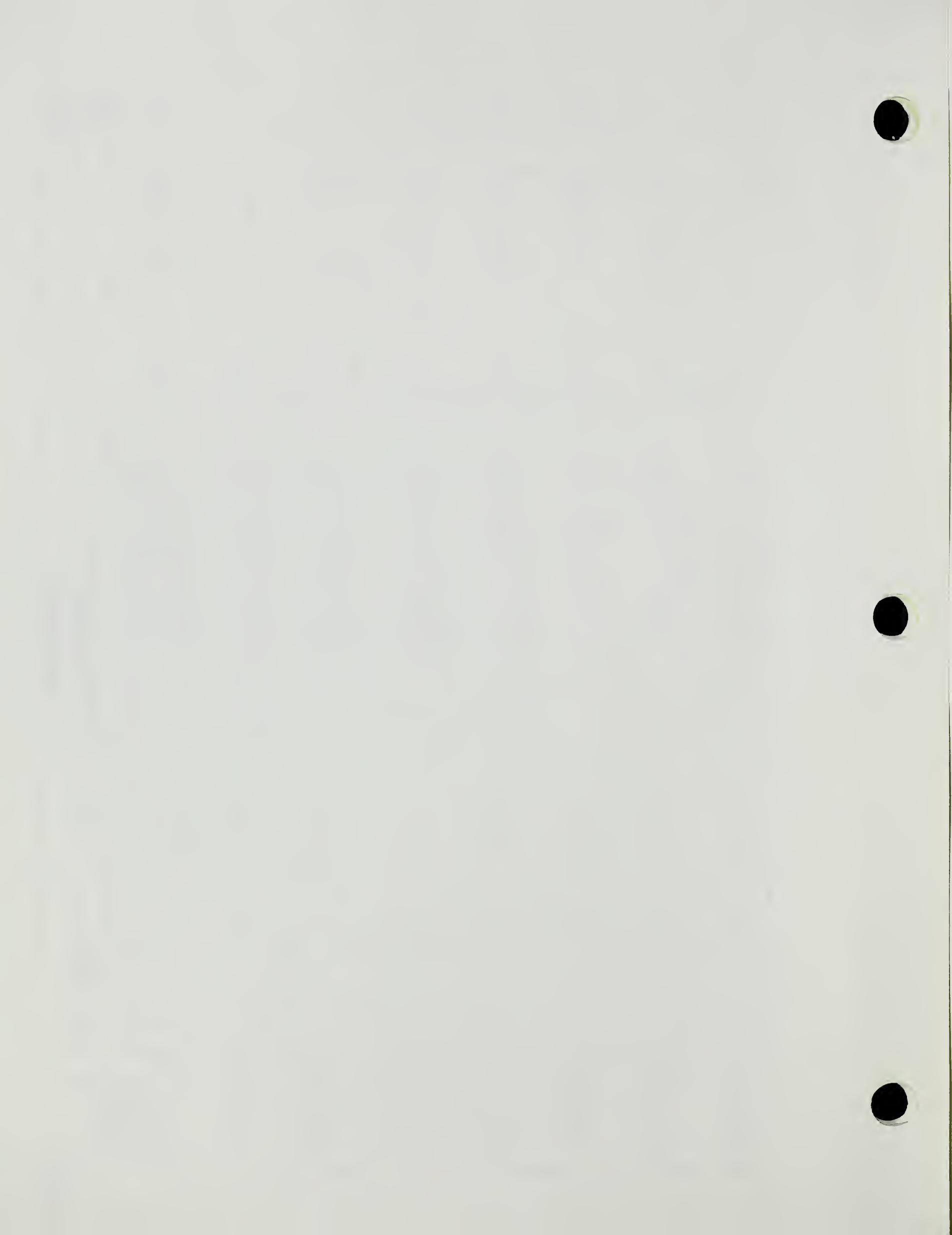
U. S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

SOIL MECHANICS
LABORATORY DATASCS-ENG-354
Rev. 3-70
File ENG-13-18

LOCATION FIELD SAMPLE NUMBER	DESCRIPTION WEPP Soil Samples	DEPTH CLASSIFICATION	GRAIN SIZE DISTRIBUTION EXPRESSED AS PERCENT FINER BY DRY WEIGHT										ATTESTING LIMITS	UNITS WEIGHT CLASSIFICATION	SCS DIST. PERCENT	MOISTURE - DENSITY RELATIONSHIPS STANDARD OR MODIFIED	UNDISTORTED SAMPLE TEST	TEST METHOD	OPTICAL TESTS				
			FINES					SAND															
			#000 0.001	0.005 0.02	0.05 0.04	0.05 0.03	0.05 0.03	#00 0.010	#00 0.010	#00 0.010	#00 0.010	#00 0.010	#00 0.010	#00 0.010	#00 0.010	#00 0.010	#00 0.010	#00 0.010	#00 0.010	#00 0.010	#00 0.010		
88C	WEPP Soil Samples	*	7	7	9	22	29	39	81	98	100												
89	Abilene -- Texas	M. Bag	*	0	3	9	23	34	76	97	100												
90	Academy -- Fresno, CA	M. Bag	*	9	11	21	39	48	56	79	90	94	94	94	96	96	100	Non- Plastic SM	27	2.75	92	34	0
91	Barnes -- Morris, MN	M. Bag	*	18	19	31	50	61	67	85	92	97	100										
92	Barnes -- McClusky, ND	M. Bag	*	22	25	37	51	62	70	88	94	98	100										
93	Heiden -- Waco, TX	M. Bag	*	52	69	85	95	100	-	0	5	13	15	23	35	62	100	52/37 CH	0	2.55	52	30	0
94	Hirsh -- Ord., NE	M. Bag	*	6	6	6	16	33	41	74	94	97	99	100									
95	Keith -- Albin, WY	M. Bag	*	20	22	28	55	82	96	99	100							32/13 CL	0	2.59	83	31	0
96	Los Banos -- Fresno, CA	M. Bag	*	43	48	62	80	92	96	99	100							46/25 CL	0	2.61	48	30	40

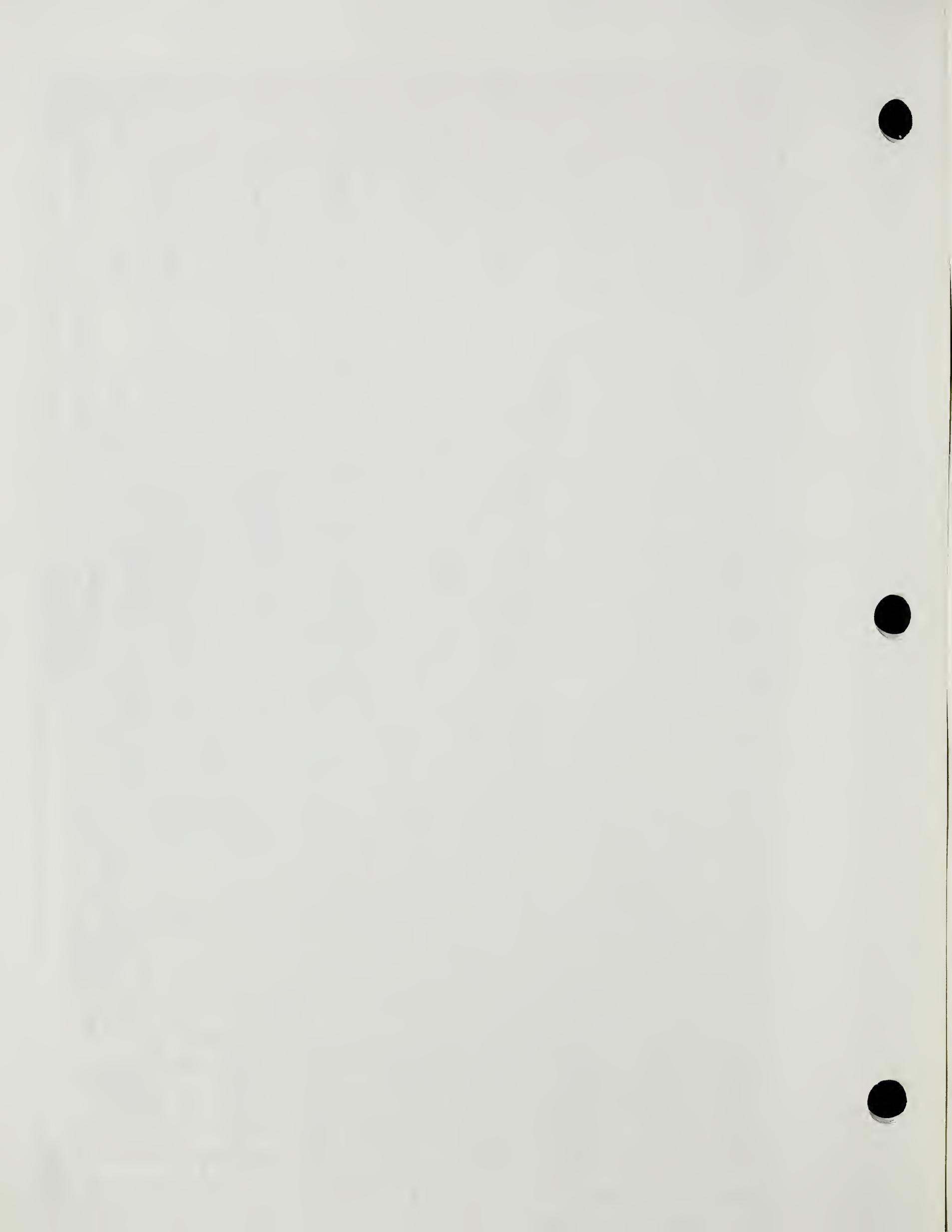
* = TESTS ARE NOT USED IN THE COMPUTATION OF CUSPIONATE STRENGTH



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SOIL CONSERVATION SERVICE

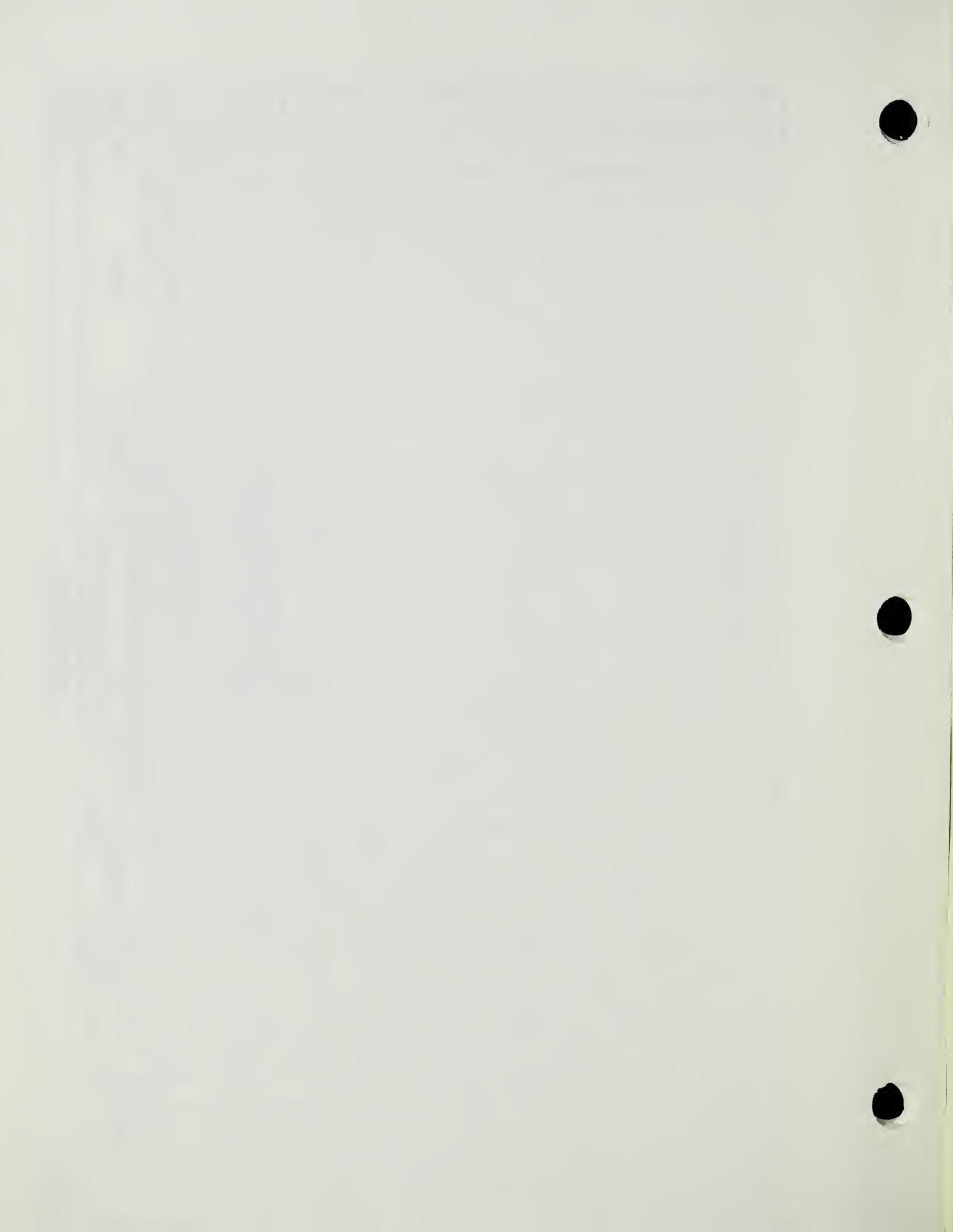
SOIL MECHANICS
LABORATORY DATA



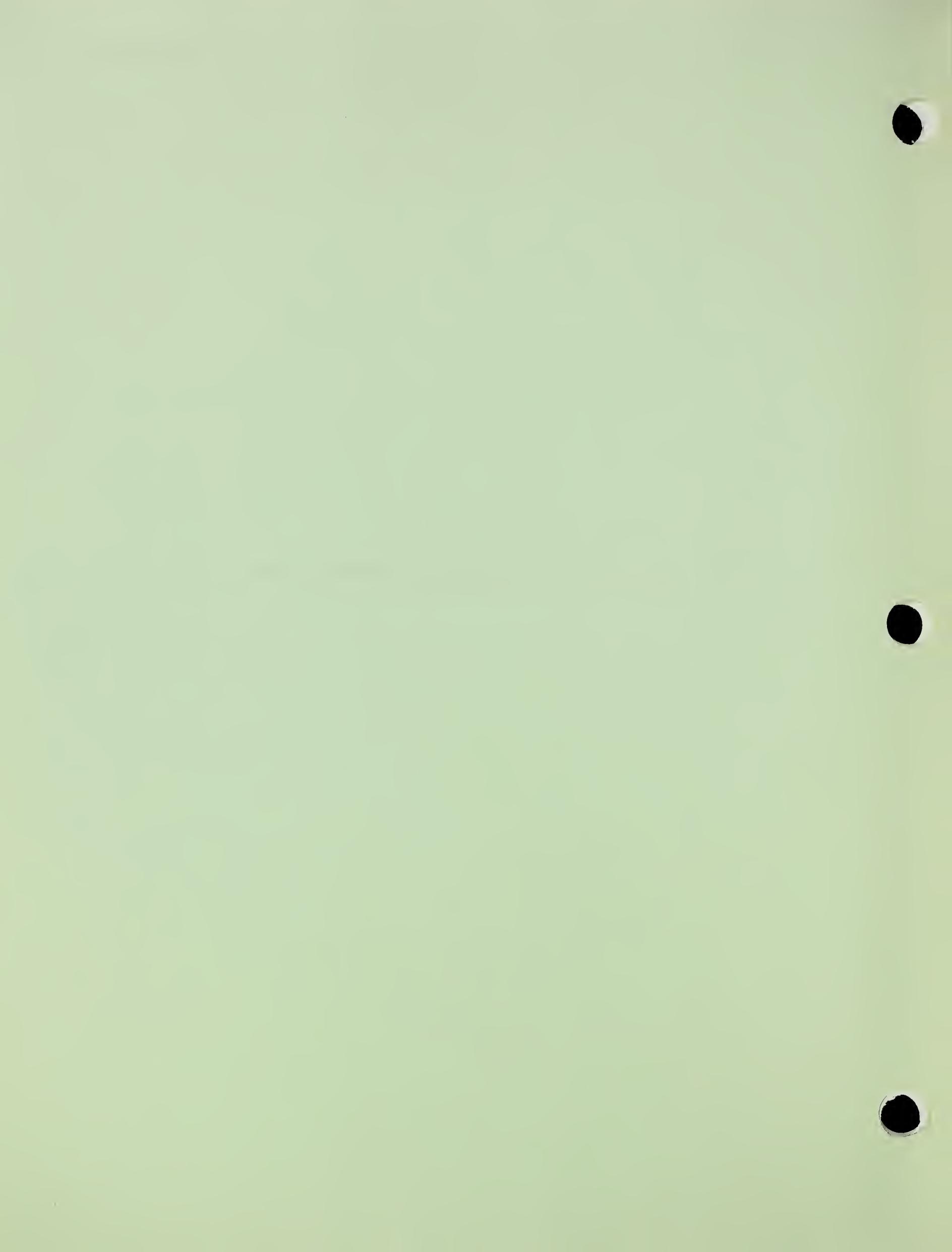
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REV. 3-70
FILE CODE ENG-13-18

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL MECHANICS
LABORATORY DATA
Book 3



Letter to C. S. Holzhey from Walter J. Rawls



Attachment B

United States
Department of
Agriculture

Agricultural
Research
Service

Beltsville Area
Beltsville Agricultural
Research Center

Beltsville, Maryland
20705

March 2, 1988

Dr. C. S. Holzhey, SCS
Federal Bldg, Rm 345
100 Centennial Mall N.
Lincoln, NE 68508-3866

Dear Dr. Holzhey:

Enclosed are the bulk density summaries for the WEPP soils you needed for the SCS Soil Mechanics Lab tests. Because of the variability of the tilled bulk density (standard deviation of $\pm 0.2 \text{ gm/cm}^3$), I recommend that the beginning bulk density be about 15 percent less than the reported tilled bulk density and the maximum bulk density be about 25 percent more than the reported 1/3 bar bulk density. For the range soils I would set the range at ± 25 percent of the 1/3 bar bulk density. I believe these ranges will cover the expected bulk density changes which can occur in the field.

As we discussed at the WEPP meeting, it would be useful if the same conditions and bulk densities the Soil Mechanics Lab uses to run their hydraulic conductivity tests could be used by your lab to determine the 1/3 bar water retention value. Also, if possible, it would be good if for 3 or 4 of the bulk densities the 0.1 bar water retention value could be determined. The water retention data will be useful in testing Ahuja's hydraulic conductivity concepts and would give us a check as to what the sample preparation does to the hydraulic properties of the soil.

I am very excited about the soil data we are compiling. It should help us to better model soil hydraulic properties.

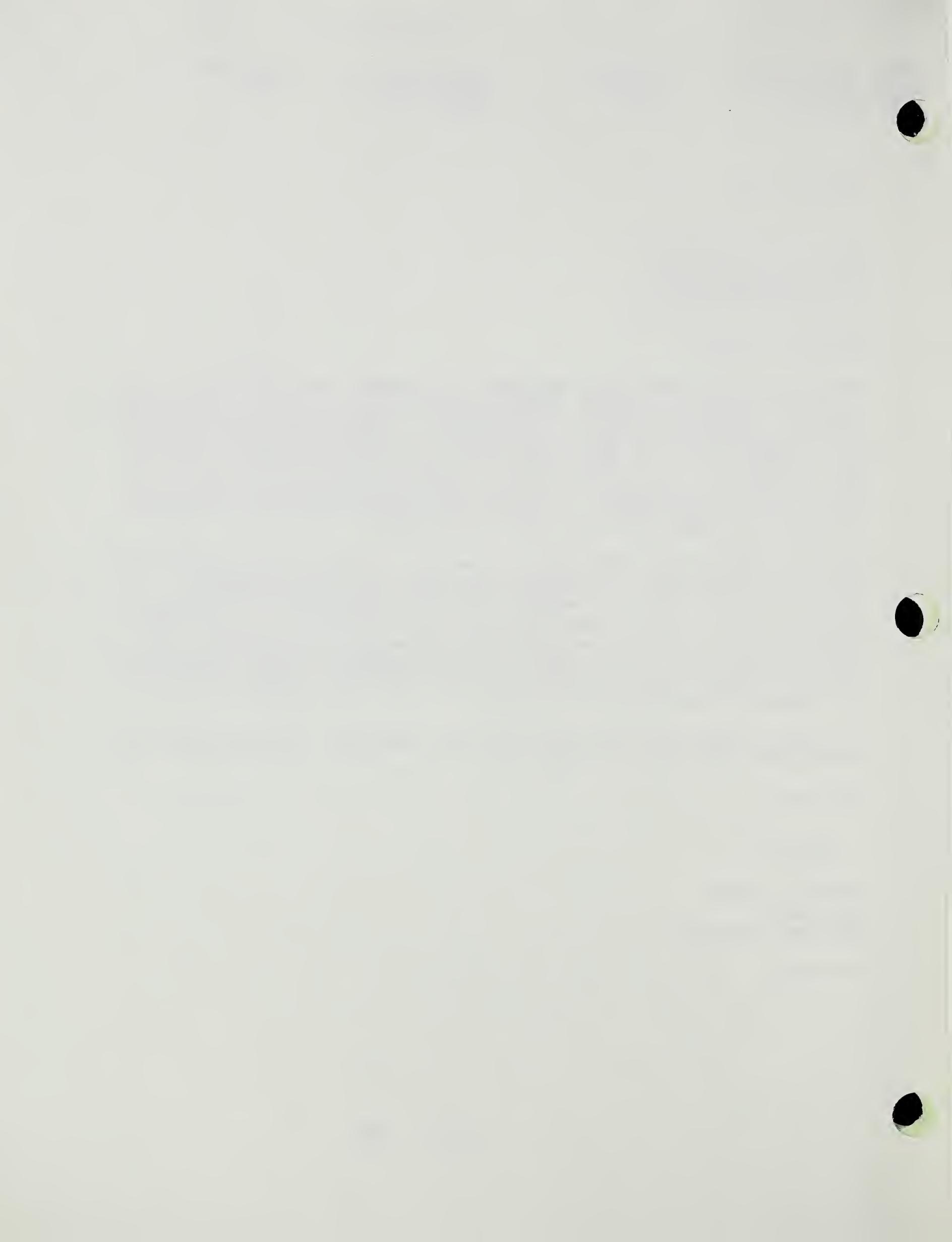
Sincerely,

Walter

WALTER J. RAWLS
Hydrologist
Hydrology Laboratory

Enclosures

MAR 7 1988



John Laffin FTS - 284-8673

on 4-4-88 - John Laffin
suggested after rain & for
our tests

87

WEPP Agricultural Soils

Soil Series	BULK Density (g/cm ³)			After Rain
	1/3 bar	Dry	Tilled	
8C100 Sharpsburg	1.28	1.64	1.14	
94 Hersh	1.65	1.70	1.14	1.43
95 Keith	1.48	1.56	.85	1.32
Amarillo	1.62	1.74	.97	1.55
105 Woodward	1.37	1.46	.86	1.41
93 Heiden	1.38	1.80	.66	.99
103 Whitney	1.80	1.82	1.37	1.54
Academy	1.80	1.90	1.35	1.61
96 Los Banos	1.36	1.74	.87	1.00
99 Protneuf	1.33	1.38	.93	1.25
Sagemoore	1.40	1.41	.96	1.38
98 Palouse	1.25	1.29	1.00	1.15
106 Zahl	1.50	1.65	1.06	1.25
97 Pierre	1.28	1.51	.88	1.05
104 Williams	1.45	1.62	.90	1.16
92 Barnes ND	1.35	1.50	.93	1.20
101 Sverdrup	1.60	1.67	1.25	1.46
91 Barnes MN	1.45	1.59	1.01	1.14



BULK DENSITY SUMMARY (g/cm³)

1987 19

WEPP Rangeland. Soils

Soil Series	Location	MOISTURE CONDITION										BULK Density g/cm ³	
		BEFORE DRY					AFTER V. WET						
		AREA		AREA			AREA			AREA			
		INTER- PACE	OPEN	SMALL AREA	UNDER PLOT	CANOPY	LARGE BURN87	CHANNEL BARE	SMALL HOLLOWE- ON L.B.	SMALL COVERED	SMALL RED	1/3 Bar	Oven Dry
Stronghold	I A1	.1	.1	1.48	.1	.1	1.32	.1	1.47	1.65	.1	1.75	1.77 1.90
Ferrest	I A2	.1	.1	1.35	.1	.1	.1	.1	1.46	.1	.1	1.60	1.67
Durorthid	I B1	.1	.1	1.00	.1	.1	1.25	.1	1.50	1.48	1.57	1.48	1.55 1.58
Not Desa Butte Id	I B2	.1	.1	1.74	.1	.1	1.48	.1	1.44	1.20	1.89	1.81	
Grant	I D1	.1	.1	.1	.1	1.40	1.27	.1	1.33	.1	1.54	1.54	1.41 1.49
Grant Eroded	I D2	.1	.1	.1	.1	1.42	1.39	.1	1.34	.1	1.47	1.61	1.48 1.53
Pratt	I E1	.1	.1	.1	.1	1.38	1.39	.1	1.50	1.63	1.52	1.40	1.53 1.53
Vintan	I E2	.1	.1	.1	.1	1.27	1.42	.1	1.39	.1	1.54	1.38	1.46
Vida	I F1	.1	.1	.1	.1	1.30	.1	.1	1.23	.1	1.83	1.48	1.23 1.47
Pierre	I H1	.1	.1	.1	.1	1.19	1.54	.1	1.33	.1	1.40	.1	1.23 1.51
Pierre	I H2	.1	.1	.1	.1	1.37	.1	.1	1.17	.1	1.52	1.57	
Hackrex	I I1	.1	.1	.1	.1	1.42	.1	.1	1.40	.1	1.43	1.49	1.39 1.44
Querencia	I J1	.1	.1	.1	.1	1.55	.1	.1	1.47	.1	1.55	1.31	1.33
Jauriga	I K1	.1	.1	.1	.1	1.24	1.25	1.03	.1	0.93	.1	1.21	1.25 1.37
Jauriga	I K2	1	0.94	1.05	.1	.1	.1	.1	1.35	.1	.1	.1	



Direct Shear Test Data



MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																										
PROJECT and STATE <i>WEPP - Abilene soil</i>			SAMPLE LOCATION <i>Texas</i>																																											
FIELD SAMPLE NO.	DEPTH	GEOLOGIC ORIGIN																																												
TYPE OF SAMPLE COMPACTED	TESTED AT <i>S.M.L., LINCOLN</i>	APPROVED BY			DATE																																									
CLASSIFICATION			LL	PI	SPECIFIC GRAVITY																																									
TYPE OF TEST <i>Consolidated Slow</i>			CONTROL STRAIN		$G_s(-)^4$	2.63																																								
RATE OF LOADING (in/min.) <i>0.0006</i>			MOISTURE CONDITION <i>FLOODED</i>		$G_s(+)^4$																																									
TYPE OF SPECIMEN <i>ROUND</i>		AREA (sq.in) <i>4.9</i>	THICKNESS (in) <i>1.0</i>		$G_m(\text{bulk})(+)^4$																																									
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MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																															
PROJECT and STATE WEPP Academy Soil		SAMPLE LOCATION TEST ID CF																																																	
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN																																																	
TYPE OF SAMPLE COMPACTED	TESTED AT S.M.L., LINCOLN	APPROVED BY			DATE																																														
CLASSIFICATION <u>Non-plastic SM</u>		LL	PI	SPECIFIC GRAVITY																																															
TYPE OF TEST <u>Consolidated Slow</u>		CONTROL STRAIN		$G_s(-)^{\#4}$	2.75																																														
RATE OF LOADING (in/min.) 0.00067		MOISTURE CONDITION <u>FLOODED</u>		$G_s(+)^{\#4}$																																															
TYPE OF SPECIMEN <u>ROUND</u>		AREA (sq.in) 4.9	THICKNESS (in) 1.0	$G_m(\text{bulk})(+)^{\#4}$																																															
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REMARKS																																																			



MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																									
PROJECT and STATE <i>WEPP Barnes So. I</i>		SAMPLE LOCATION <i>MOTTIS MN</i>																																											
FIELD SAMPLE NO.	DEPTH	GEOLOGIC ORIGIN																																											
TYPE OF SAMPLE <i>COMPACTED</i>	TESTED AT <i>S.M.L., LINCOLN</i>	APPROVED BY			DATE																																								
CLASSIFICATION <i>CL</i>	LL <u>26</u> PI <u>9</u>				SPECIFIC GRAVITY																																								
TYPE OF TEST <i>Consolidated Slow</i>	CONTROL STRAIN			$G_s(-)^4$	0.61																																								
RATE OF LOADING (in/min.) <i>0.0006</i>	MOISTURE CONDITION <i>FLOODED</i>			$G_s(+)^4$																																									
TYPE OF SPECIMEN <i>ROUND</i>	AREA (sq.in) <i>4.9</i>	THICKNESS (in) <i>1.0</i>		$G_m(\text{bulk})(+)^4$																																									
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MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																									
PROJECT and STATE WEPP Barnes Soil		SAMPLE LOCATION McClusky, ND																																											
FIELD SAMPLE NO.	DEPTH	GEOLOGIC ORIGIN																																											
TYPE OF SAMPLE COMPACTED	TESTED AT S.M.L., LINCOLN	APPROVED BY			DATE																																								
CLASSIFICATION CL		LL 31	PI 12	SPECIFIC GRAVITY																																									
TYPE OF TEST Consolidated Slow		CONTROL STRAIN		$G_s(-)^{1/4}$	2.55																																								
RATE OF LOADING (in/min.) 0.00064		MOISTURE CONDITION FLOODED		$G_s(+)^{1/4}$																																									
TYPE OF SPECIMEN ROUND		AREA (sq.in) 4.9	THICKNESS (in) 1.0	$G_m(\text{bulk})(+)^{1/4}$																																									
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TEST NO.	1	2	3	4																																									
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MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																									
PROJECT and STATE <i>WEPP Heiden Soil</i>				SAMPLE LOCATION <i>W.W.C., T.Y.</i>																																									
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN																																											
TYPE OF SAMPLE COMPACTED	TESTED AT <i>S.M.L., LINCOLN</i>	APPROVED BY		DATE																																									
CLASSIFICATION <i>C H</i>		LL <u>52</u>	PI <u>37</u>	SPECIFIC GRAVITY																																									
TYPE OF TEST			CONTROL STRAIN	$G_s(-)^4$	2.67																																								
RATE OF LOADING (in/min.) <i>0.00064</i>			MOISTURE CONDITION <i>FLOODED</i>	$G_s(+)^4$																																									
TYPE OF SPECIMEN <i>ROUND</i>	AREA (sq.in) <i>4.9</i>	THICKNESS (in.) <i>.10</i>	$G_m(\text{bulk})(+)^4$																																										
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MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																									
PROJECT and STATE WEPP Hirsh Soil				SAMPLE LOCATION Ord. NE																																									
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN																																											
TYPE OF SAMPLE COMPACTED	TESTED AT S.M.L., LINCOLN	APPROVED BY			DATE																																								
CLASSIFICATION <u>Non-plastic SM</u>		LL	PI	SPECIFIC GRAVITY																																									
TYPE OF TEST <u>Consolidated Slow</u>		CONTROL STRAIN		$G_s(-)^4$	263																																								
RATE OF LOADING (in/min.) 0.0006	MOISTURE CONDITION <u>FLOODED</u>			$G_s(+)^4$																																									
TYPE OF SPECIMEN ROUND	AREA (sq.in) 4.9	THICKNESS (in) 1.0	$G_m(\text{bulk})(+)^4$																																										
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TEST NO.	1	2	3	4																																									
INIT MOISTURE, %	2.65	2.65	2.65																																										
DRY DENSITY, $\frac{\text{g}}{\text{cc}}$ <input checked="" type="checkbox"/> $\frac{\text{pcf}}{\text{}}$ <input type="checkbox"/>	1.43	1.43	1.43																																										
INIT VOID RATIO	.8392	.8392	.8392																																										
TEST DURATION, (min)	500	488	458																																										
FINAL MOISTURE, %	18.6	18.0	16.6																																										
NORMAL STRESS, psi	2	4	6																																										
MAX SHEAR STRESS, psi	1.2	1.9	3.2																																										
<table border="1"> <thead> <tr> <th>SHEAR VALUES</th> <th>ϕ</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>AT MAXIMUM STRESS</td> <td>28°</td> <td>0</td> </tr> </tbody> </table>						SHEAR VALUES	ϕ	c	AT MAXIMUM STRESS	28°	0																																		
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AT MAXIMUM STRESS	28°	0																																											
REMARKS																																													



MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																															
PROJECT and STATE <i>WEPP Keith Soil</i>				SAMPLE LOCATION <i>Albin, WY</i>																																															
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN																																																	
TYPE OF SAMPLE <i>COMPACTED</i>	TESTED AT <i>S.M.L., LINCOLN</i>	APPROVED BY			DATE																																														
CLASSIFICATION <i>CL</i>		LL <u>32</u> PI <u>13</u>		SPECIFIC GRAVITY																																															
TYPE OF TEST <i>Consolidated Slow</i>		CONTROL STRAIN		$G_s(-)^{\#4}$	$\gamma = 0$																																														
RATE OF LOADING (in/min.) <i>0.00064</i>		MOISTURE CONDITION <i>FLOODED</i>		$G_s(+)^{\#4}$																																															
TYPE OF SPECIMEN <i>ROUND</i>		AREA (sq.in) <i>4.9</i>	THICKNESS (in.) <i>.10</i>	$G_m(\text{bulk})(+)^{\#4}$																																															
 SHEARING STRESS (τ) CHANGE IN THICKNESS (δ) DISPLACEMENT (%)		<table border="1"> <thead> <tr> <th>TEST NO.</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>INIT MOISTURE, %</td> <td>14.4</td> <td>14.4</td> <td>14.4</td> <td></td> </tr> <tr> <td>DRY DENSITY, $\frac{\text{g/cc}}{\text{pcf}}$</td> <td>1.32</td> <td>1.32</td> <td>1.32</td> <td></td> </tr> <tr> <td>INIT VOID RATIO</td> <td>.9621</td> <td>.9621</td> <td>.9621</td> <td></td> </tr> <tr> <td>TEST DURATION, (min)</td> <td>456</td> <td>469</td> <td>469</td> <td></td> </tr> <tr> <td>FINAL MOISTURE, %</td> <td>29.8</td> <td>26.5</td> <td>25.0</td> <td></td> </tr> <tr> <td>NORMAL STRESS, psi</td> <td>2</td> <td>4</td> <td>6</td> <td></td> </tr> <tr> <td>MAX SHEAR STRESS, psi</td> <td>1.1</td> <td>2.4</td> <td>3.6</td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>SHEAR VALUES</th> <th>ϕ</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>AT MAXIMUM STRESS</td> <td>31°</td> <td>0</td> </tr> </tbody> </table> SHEARING STRESS (τ) psi NORMAL STRESS (σ) psi				TEST NO.	1	2	3	4	INIT MOISTURE, %	14.4	14.4	14.4		DRY DENSITY, $\frac{\text{g/cc}}{\text{pcf}}$	1.32	1.32	1.32		INIT VOID RATIO	.9621	.9621	.9621		TEST DURATION, (min)	456	469	469		FINAL MOISTURE, %	29.8	26.5	25.0		NORMAL STRESS, psi	2	4	6		MAX SHEAR STRESS, psi	1.1	2.4	3.6		SHEAR VALUES	ϕ	c	AT MAXIMUM STRESS	31°	0
TEST NO.	1	2	3	4																																															
INIT MOISTURE, %	14.4	14.4	14.4																																																
DRY DENSITY, $\frac{\text{g/cc}}{\text{pcf}}$	1.32	1.32	1.32																																																
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AT MAXIMUM STRESS	31°	0																																																	
REMARKS																																																			



MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																															
PROJECT and STATE <i>WEPP Los Banos Soil</i>		SAMPLE LOCATION <i>Fresno, CA</i>																																																	
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN																																																	
TYPE OF SAMPLE <i>COMPACTED</i>	TESTED AT <i>S.M.L., LINCOLN</i>	APPROVED BY			DATE																																														
CLASSIFICATION <i>CL</i>		LL <i>46</i>	PI <i>25</i>	SPECIFIC GRAVITY																																															
TYPE OF TEST <i>Consolidated Slow</i>		CONTROL STRAIN	$G_s(-)^{\frac{1}{4}}$	≥ 61																																															
RATE OF LOADING (in/min.) <i>0.0006</i>		MOISTURE CONDITION <i>FLOODED</i>	$G_s(+)^{\frac{1}{4}}$																																																
TYPE OF SPECIMEN <i>ROUND</i>	AREA (sq.in) <i>4.9</i>	THICKNESS (in) <i>.10</i>	$G_m(\text{bulk})(+)^{\frac{1}{4}}$																																																
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TEST NO.	1	2	3	4																																															
INIT MOISTURE, %	15.9	15.9	15.9																																																
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REMARKS																																																			



MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																															
PROJECT and STATE WEPP Pierre Soil				SAMPLE LOCATION cottonwood sc																																															
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN																																																	
TYPE OF SAMPLE COMPACTED	TESTED AT S.M.L., LINCOLN	APPROVED BY			DATE																																														
CLASSIFICATION C+H		LL 52	PI 32	SPECIFIC GRAVITY																																															
TYPE OF TEST Consolidated Slow		CONTROL STRAIN		$G_s(-)^*4$	2.71																																														
RATE OF LOADING (in/min) 0.00064		MOISTURE CONDITION FLOODED		$G_s(+)^*4$																																															
TYPE OF SPECIMEN ROUND	AREA (sq.in) 4.9	THICKNESS (in) 1.0		$G_m(\text{bulk})(+)^*4$																																															
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TEST NO.	1	2	3	4																																															
INIT MOISTURE, %	16.4	16.4	16.4																																																
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AT MAXIMUM STRESS	32°	0																																																	
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MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																															
PROJECT and STATE WEPP Pa/ouse So. I				SAMPLE LOCATION Pullman, WA																																															
FIELD SAMPLE NO.	DEPTH	GEOLOGIC ORIGIN																																																	
TYPE OF SAMPLE COMPACTED	TESTED AT S.M.L., LINCOLN	APPROVED BY			DATE																																														
CLASSIFICATION CL		LL 31	PI 13	SPECIFIC GRAVITY																																															
TYPE OF TEST <i>Consolidated Slow</i>		CONTROL STRAIN	$G_s(-)^{\#4}$	2.64																																															
RATE OF LOADING (in/min.) 0.00064	MOISTURE CONDITION <i>FLOODED</i>	$G_s(+)^{\#4}$																																																	
TYPE OF SPECIMEN ROUND	AREA (sq.in) 4.9	THICKNESS (in.) 1.0	$G_m(\text{bulk})(+)^{\#4}$																																																
<p>Shearing Stress (τ)</p> <p>DISPLACEMENT (%)</p>		<table border="1"> <thead> <tr> <th>TEST NO.</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>INIT. MOISTURE, %</td> <td>14.2</td> <td>14.2</td> <td>14.2</td> <td></td> </tr> <tr> <td>DRY DENSITY, <input checked="" type="checkbox"/> g/cc <input type="checkbox"/> pcf</td> <td>1.15</td> <td>1.15</td> <td>1.15</td> <td></td> </tr> <tr> <td>INIT. VOID RATIO</td> <td>1.2956</td> <td>1.2956</td> <td>1.2956</td> <td></td> </tr> <tr> <td>TEST DURATION, (min)</td> <td>438</td> <td>469</td> <td>469</td> <td></td> </tr> <tr> <td>FINAL MOISTURE, %</td> <td>30.8</td> <td>29.8</td> <td>28.6</td> <td></td> </tr> <tr> <td>NORMAL STRESS, psi</td> <td>2</td> <td>4</td> <td>6</td> <td></td> </tr> <tr> <td>MAX. SHEAR STRESS, psi</td> <td>1.4</td> <td>2.6</td> <td>3.8</td> <td></td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>SHEAR VALUES</th> <th>ϕ</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>AT MAXIMUM STRESS</td> <td>31°</td> <td>25 psf</td> </tr> </tbody> </table>				TEST NO.	1	2	3	4	INIT. MOISTURE, %	14.2	14.2	14.2		DRY DENSITY, <input checked="" type="checkbox"/> g/cc <input type="checkbox"/> pcf	1.15	1.15	1.15		INIT. VOID RATIO	1.2956	1.2956	1.2956		TEST DURATION, (min)	438	469	469		FINAL MOISTURE, %	30.8	29.8	28.6		NORMAL STRESS, psi	2	4	6		MAX. SHEAR STRESS, psi	1.4	2.6	3.8		SHEAR VALUES	ϕ	c	AT MAXIMUM STRESS	31°	25 psf
TEST NO.	1	2	3	4																																															
INIT. MOISTURE, %	14.2	14.2	14.2																																																
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REMARKS																																																			



MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																									
PROJECT and STATE WEPP Portneuf Soil				SAMPLE LOCATION Kimberly, ID																																									
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN																																											
TYPE OF SAMPLE COMPACTED	TESTED AT S.M.L., LINCOLN	APPROVED BY			DATE																																								
CLASSIFICATION CL - ML				LL 28 PI 4	SPECIFIC GRAVITY																																								
TYPE OF TEST Consolidated Slow				CONTROL STRAIN	$G_s(-)^*4$ 2.66																																								
RATE OF LOADING (in/min.) 0.0006		MOISTURE CONDITION FLOODED		$G_s(+)^*4$																																									
TYPE OF SPECIMEN ROUND		AREA (sq.in) 4.9	THICKNESS (in) 1.0	$G_m(\text{bulk})(+)^*4$																																									
<table border="1"> <thead> <tr> <th>TEST NO.</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>INIT MOISTURE, %</td> <td>15.8</td> <td>15.8</td> <td>15.8</td> <td></td> </tr> <tr> <td>DRY DENSITY, $\frac{\text{g}}{\text{cc}}$</td> <td>1.25</td> <td>1.25</td> <td>1.25</td> <td></td> </tr> <tr> <td>INIT VOID RATIO</td> <td>1.1280</td> <td>1.1280</td> <td>1.1280</td> <td></td> </tr> <tr> <td>TEST DURATION, (min)</td> <td>463</td> <td>500</td> <td>498</td> <td></td> </tr> <tr> <td>FINAL MOISTURE, %</td> <td>34.0</td> <td>31.3</td> <td>33.4</td> <td></td> </tr> <tr> <td>NORMAL STRESS, psi</td> <td>2</td> <td>4</td> <td>6</td> <td></td> </tr> <tr> <td>MAX SHEAR STRESS, psi</td> <td>1.4</td> <td>2.1</td> <td>2.7</td> <td></td> </tr> </tbody> </table>						TEST NO.	1	2	3	4	INIT MOISTURE, %	15.8	15.8	15.8		DRY DENSITY, $\frac{\text{g}}{\text{cc}}$	1.25	1.25	1.25		INIT VOID RATIO	1.1280	1.1280	1.1280		TEST DURATION, (min)	463	500	498		FINAL MOISTURE, %	34.0	31.3	33.4		NORMAL STRESS, psi	2	4	6		MAX SHEAR STRESS, psi	1.4	2.1	2.7	
TEST NO.	1	2	3	4																																									
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SHEAR VALUES		ϕ	c																																										
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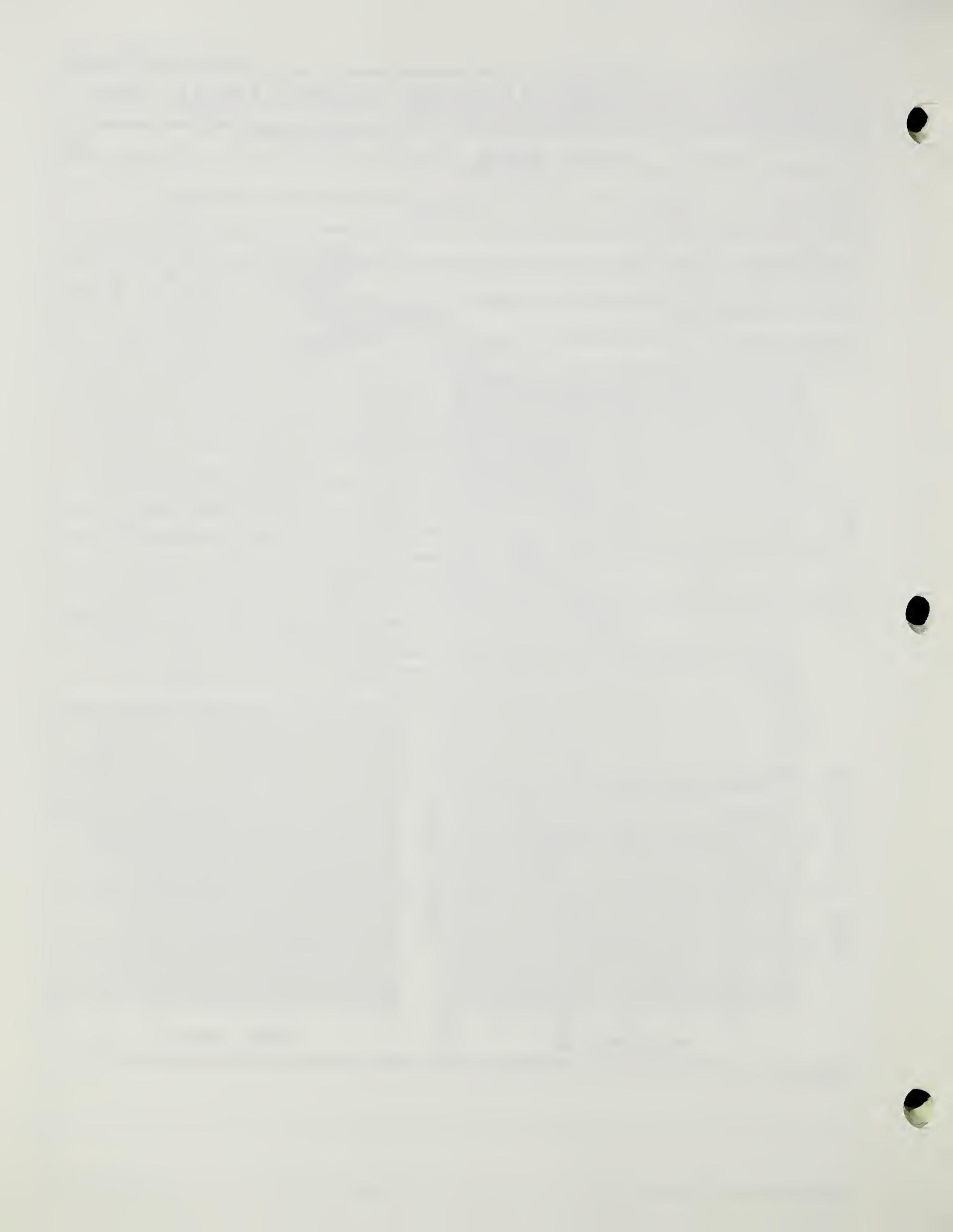
MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																									
PROJECT and STATE WEPP Sharpsburg Soil		SAMPLE LOCATION Linear 1																																											
FIELD SAMPLE NO	DEPT-	GEOLOGIC ORIGIN																																											
TYPE OF SAMPLE Composted	TESTED AT S.M.L., Lincoln	APPROVED BY			DATE																																								
CLASSIFICATION CL		LL 49	PI 30	SPECIFIC GRAVITY																																									
TYPE OF TEST Consolidated Slow		CONTROL Strain	$G_s(-)^4$	2.63																																									
RATE OF LOADING (in/min.) 0.00064		MOISTURE CONDITION Flooded	$G_s(+)^4$																																										
TYPE OF SPECIMEN Round		AREA (sq.in) 1.0	THICKNESS (in) 1.0	$G_m(\text{bulk})(+)^4$																																									
		<table border="1"> <thead> <tr> <th>TEST NO</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>INIT MOISTURE, %</td> <td>19.3</td> <td>10.2</td> <td>9.93</td> <td></td> </tr> <tr> <td>DRY DENSITY, $\frac{\text{g/cc}}{\text{pcf}}$</td> <td>1.14</td> <td>1.14</td> <td>1.14</td> <td></td> </tr> <tr> <td>INIT VOID RATIO</td> <td>1.3070</td> <td>1.3070</td> <td>1.3070</td> <td></td> </tr> <tr> <td>TEST DURATION, (min)</td> <td>462</td> <td>469</td> <td>477</td> <td></td> </tr> <tr> <td>FINAL MOISTURE, %</td> <td>25.26</td> <td>30.02</td> <td>39.71</td> <td></td> </tr> <tr> <td>NORMAL STRESS psi</td> <td>0</td> <td>-</td> <td>6</td> <td></td> </tr> <tr> <td>MAX SHEAR STRESS psi</td> <td>1.3</td> <td>2.5</td> <td>4.0</td> <td></td> </tr> </tbody> </table>				TEST NO	1	2	3	4	INIT MOISTURE, %	19.3	10.2	9.93		DRY DENSITY, $\frac{\text{g/cc}}{\text{pcf}}$	1.14	1.14	1.14		INIT VOID RATIO	1.3070	1.3070	1.3070		TEST DURATION, (min)	462	469	477		FINAL MOISTURE, %	25.26	30.02	39.71		NORMAL STRESS psi	0	-	6		MAX SHEAR STRESS psi	1.3	2.5	4.0	
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SHEAR VALUES	ϕ	c																																											
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REMARKS																																													



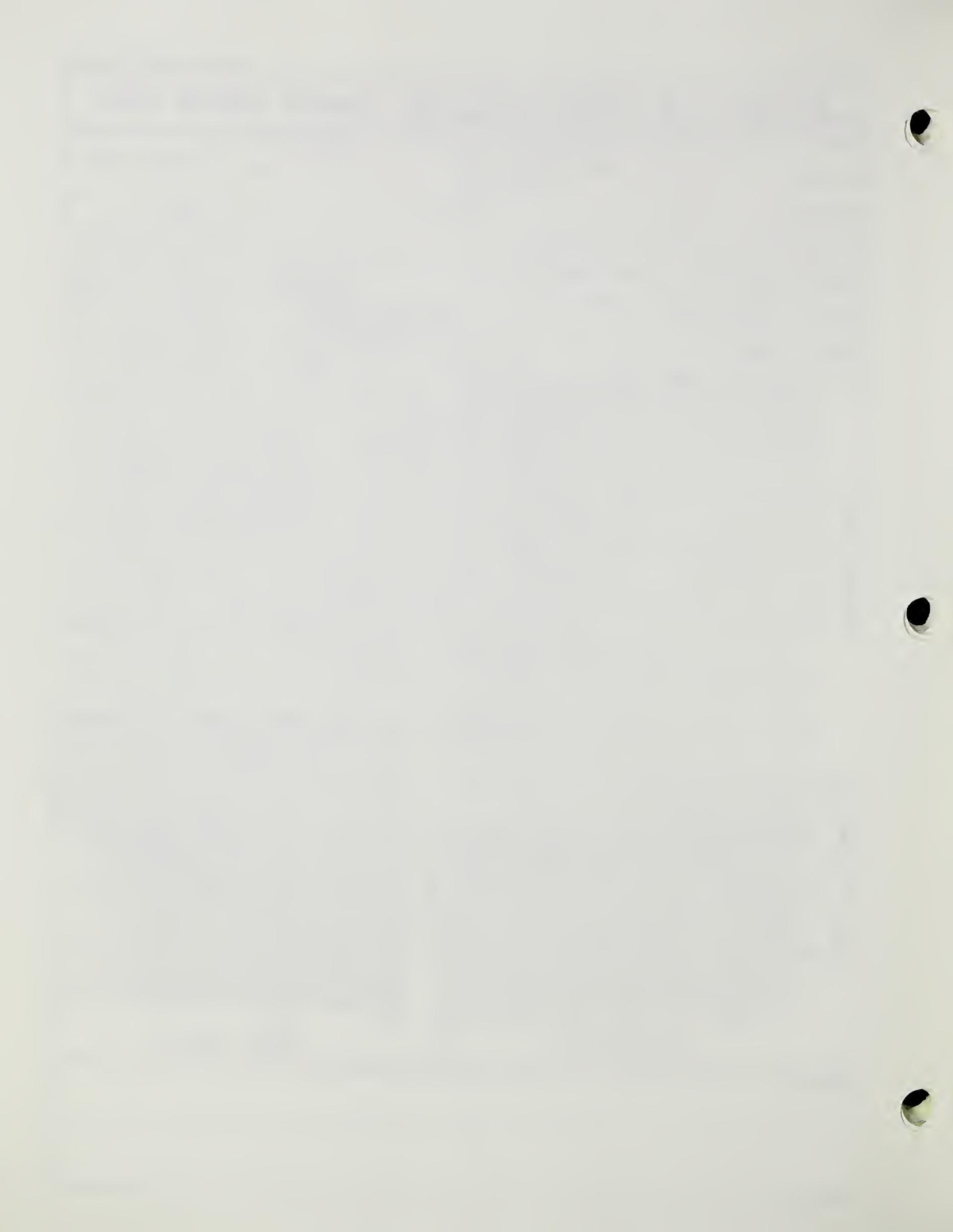
MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																									
PROJECT and STATE <i>WEPP Sverdrup Soil</i>				SAMPLE LOCATION <i>Morris MN</i>																																									
FIELD SAMPLE NO.	DEPTH	GEOLOGIC ORIGIN																																											
TYPE OF SAMPLE <i>Composted</i>	TESTED AT <i>SP L, Lincoln</i>	APPROVED BY		DATE																																									
CLASSIFICATION <i>SC</i>		LL <u>25</u>	PI <u>9</u>	SPECIFIC GRAVITY																																									
TYPE OF TEST <i>Consolidated Slow</i>		CONTROL Strain		$G_s(-)^{\#4}$	2.63																																								
RATE OF LOADING (in/min) <i>0 0006</i>		MOISTURE CONDITION <i>Flooded</i>		$G_s(+)^{\#4}$																																									
TYPE OF SPECIMEN <i>Round</i>	AREA (sq.in) <u>4.0</u>	THICKNESS (in) <u>1.0</u>		$G_m(\text{bulk})(+)^{\#4}$																																									
<table border="1"> <thead> <tr> <th>TEST NO</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>INIT MOISTURE, %</td> <td>10.21</td> <td>10.21</td> <td>10.21</td> <td></td> </tr> <tr> <td>DRY DENSITY, <input checked="" type="checkbox"/> g/cc <input type="checkbox"/> pcf</td> <td>1.44</td> <td>1.44</td> <td>1.44</td> <td></td> </tr> <tr> <td>INIT VOID RATIO</td> <td>.8014</td> <td>.8014</td> <td>.8014</td> <td></td> </tr> <tr> <td>TEST DURATION, (min)</td> <td>483</td> <td>459</td> <td>433</td> <td></td> </tr> <tr> <td>FINAL MOISTURE, %</td> <td>20.3</td> <td>20.3</td> <td>18.21</td> <td></td> </tr> <tr> <td>NORMAL STRESS, psf</td> <td>2</td> <td>2</td> <td>6</td> <td></td> </tr> <tr> <td>MAX SHEAR STRESS, psf</td> <td>1.0</td> <td>2.1</td> <td>2.8</td> <td></td> </tr> </tbody> </table>						TEST NO	1	2	3	4	INIT MOISTURE, %	10.21	10.21	10.21		DRY DENSITY, <input checked="" type="checkbox"/> g/cc <input type="checkbox"/> pcf	1.44	1.44	1.44		INIT VOID RATIO	.8014	.8014	.8014		TEST DURATION, (min)	483	459	433		FINAL MOISTURE, %	20.3	20.3	18.21		NORMAL STRESS, psf	2	2	6		MAX SHEAR STRESS, psf	1.0	2.1	2.8	
TEST NO	1	2	3	4																																									
INIT MOISTURE, %	10.21	10.21	10.21																																										
DRY DENSITY, <input checked="" type="checkbox"/> g/cc <input type="checkbox"/> pcf	1.44	1.44	1.44																																										
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MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																									
PROJECT and STATE <u>W.E.P Walla Walla Soil</u>		SAMPLE LOCATION <u>Elkumar, W.F.</u>																																											
FIELD SAMPLE NO.	DEPTH	GEOLOGIC ORIGIN																																											
TYPE OF SAMPLE <u>Compacted</u>	TESTED AT <u>Sherman, Lincoln</u>	APPROVED BY			DATE																																								
CLASSIFICATION <u>CL - ML</u>		LL <u>28</u>	PI <u>4</u>	SPECIFIC GRAVITY																																									
TYPE OF TEST <u>Consolidated Slow</u>		CONTROL Strain		$G_s(-)^{\#4}$	<u>2.65</u>																																								
RATE OF LOADING (in/min) <u>0.00064</u>		MOISTURE CONDITION <u>Flooded</u>		$G_s(+)^{\#4}$																																									
TYPE OF SPECIMEN <u>Round</u>	AREA (sq.in) <u>4.9</u>	THICKNESS (in) <u>1.0</u>		$G_m(\text{bulk})(+)^{\#4}$																																									
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TEST NO	1	2	3	4																																									
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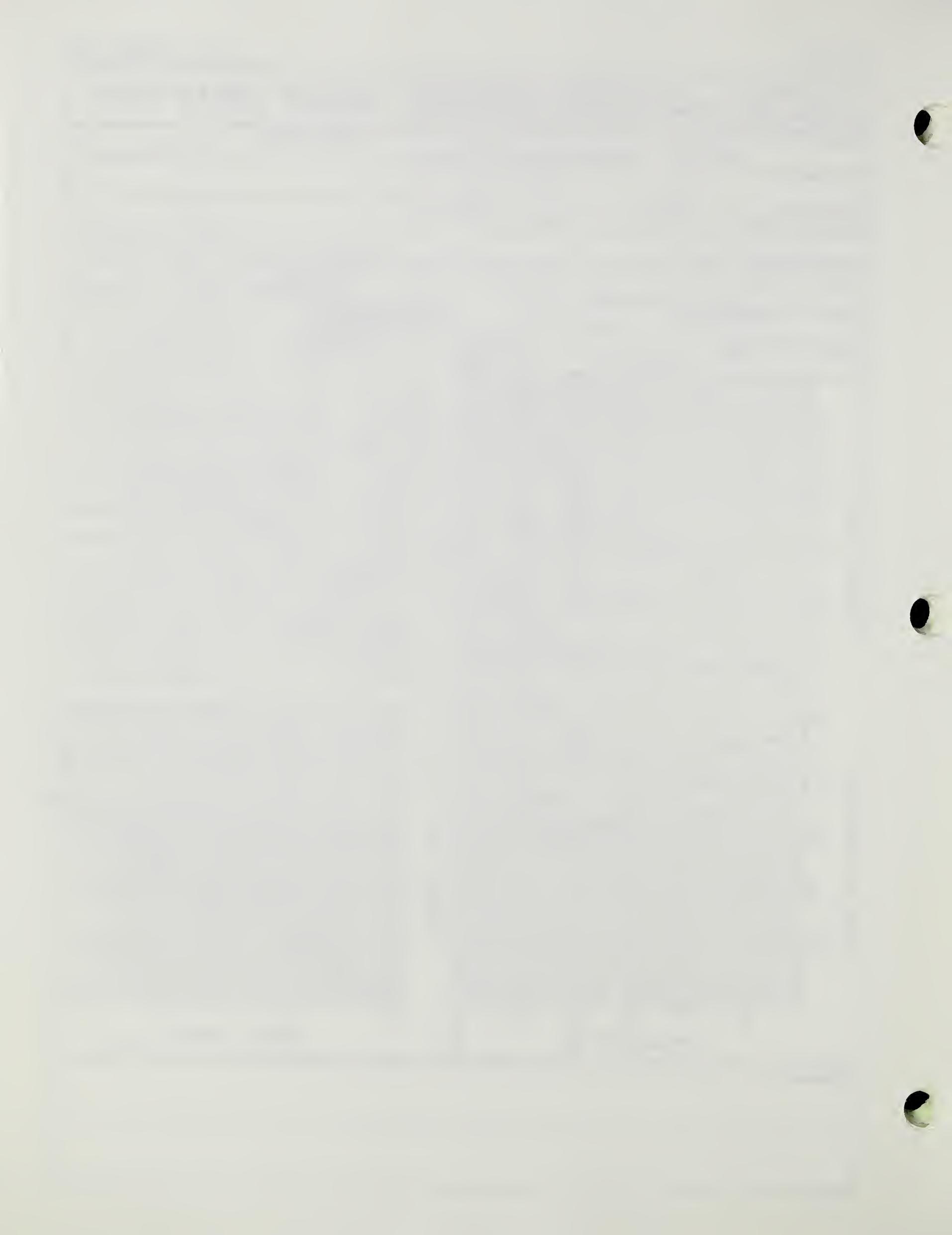
MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																									
PROJECT and STATE W E PP Whitney So.,				SAMPLE LOCATION Fresno, CA																																									
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN																																											
TYPE OF SAMPLE Compacted	TESTED AT S. M. L. Lincoln	APPROVED BY			DATE																																								
CLASSIFICATION Non-plastic SM		LL	PI	SPECIFIC GRAVITY																																									
TYPE OF TEST Consolidated Slow		CONTROL Stress		$G_s(-)^4$	2.67																																								
RATE OF LOADING (in/min.) 0.0004		MOISTURE CONDITION Flooded		$G_s(+)^4$																																									
TYPE OF SPECIMEN Round		AREA (sq.in) 4.9	THICKNESS (in) 1.0	$G_m(\text{bulk})(+)^4$																																									
		<table border="1"> <thead> <tr> <th>TEST NO.</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>INIT MOISTURE, %</td> <td>7.34</td> <td>7.34</td> <td>7.34</td> <td></td> </tr> <tr> <td>DRY DENSITY, σ/cc</td> <td>1.54</td> <td>1.54</td> <td>1.54</td> <td></td> </tr> <tr> <td>INIT VOID RATIO</td> <td>.7338</td> <td>.7338</td> <td>.7338</td> <td></td> </tr> <tr> <td>TEST DURATION, (min)</td> <td>469</td> <td>469</td> <td>469</td> <td></td> </tr> <tr> <td>FINAL MOISTURE, %</td> <td>15.2</td> <td>16.3</td> <td>15.5</td> <td></td> </tr> <tr> <td>NORMAL STRESS, psi</td> <td>2</td> <td>4</td> <td>6</td> <td></td> </tr> <tr> <td>MAX SHEAR STRESS, psi</td> <td>1.3</td> <td>2.5</td> <td>3.5</td> <td></td> </tr> </tbody> </table>				TEST NO.	1	2	3	4	INIT MOISTURE, %	7.34	7.34	7.34		DRY DENSITY, σ/cc	1.54	1.54	1.54		INIT VOID RATIO	.7338	.7338	.7338		TEST DURATION, (min)	469	469	469		FINAL MOISTURE, %	15.2	16.3	15.5		NORMAL STRESS, psi	2	4	6		MAX SHEAR STRESS, psi	1.3	2.5	3.5	
TEST NO.	1	2	3	4																																									
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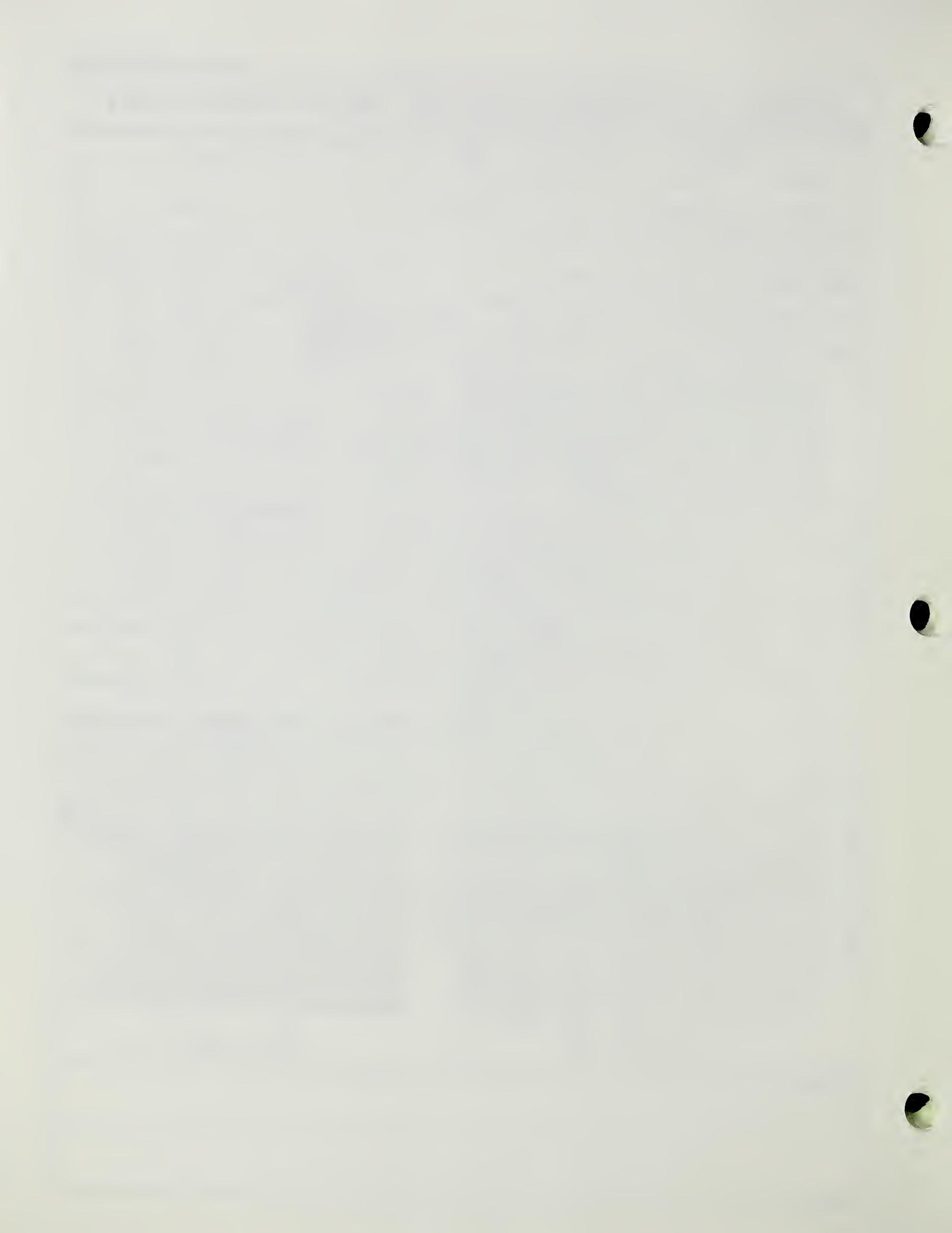
MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST																																										
PROJECT and STATE <u>WEPP</u>		<u>Williams Soil</u>		SAMPLE LOCATION <u>McClusky ND</u>																																										
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN																																												
TYPE OF SAMPLE <u>COMPACTED</u>	TESTED AT <u>S.M.L., LINCOLN</u>	APPROVED BY			DATE																																									
CLASSIFICATION		LL	PI	SPECIFIC GRAVITY																																										
TYPE OF TEST <u>Consol. dated Slow</u>		CONTROL STRAIN		$G_s(-)^{\#4}$	2.59																																									
RATE OF LOADING (in/min.) <u>0.00064</u>		MOISTURE CONDITION <u>FLOODED</u>		$G_s(+)^{\#4}$																																										
TYPE OF SPECIMEN <u>ROUND</u>		AREA (sq.in) <u>4.9</u>	THICKNESS (in) <u>1.0</u>	$G_m(\text{bulk})(+)^{\#4}$																																										
SHEARING STRESS (τ) psi	<table border="1"> <thead> <tr> <th>TEST NO.</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>INIT MOISTURE, %</td> <td>16.78</td> <td>16.78</td> <td>16.78</td> <td></td> </tr> <tr> <td>DRY DENSITY, $\frac{\text{g/cc}}{\text{pcf}}$</td> <td>1.16</td> <td>1.16</td> <td>1.16</td> <td></td> </tr> <tr> <td>INIT VOID RATIO</td> <td>1.2325</td> <td>1.2328</td> <td>1.2328</td> <td></td> </tr> <tr> <td>TEST DURATION, (min)</td> <td>469</td> <td>469</td> <td>469</td> <td></td> </tr> <tr> <td>FINAL MOISTURE, %</td> <td>28.87</td> <td>27.27</td> <td>24.88</td> <td></td> </tr> <tr> <td>NORMAL STRESS psi</td> <td>2</td> <td>4</td> <td>6</td> <td></td> </tr> <tr> <td>MAX. SHEAR STRESS psi</td> <td>1.2</td> <td>2.3</td> <td>3.6</td> <td></td> </tr> </tbody> </table>					TEST NO.	1	2	3	4	INIT MOISTURE, %	16.78	16.78	16.78		DRY DENSITY, $\frac{\text{g/cc}}{\text{pcf}}$	1.16	1.16	1.16		INIT VOID RATIO	1.2325	1.2328	1.2328		TEST DURATION, (min)	469	469	469		FINAL MOISTURE, %	28.87	27.27	24.88		NORMAL STRESS psi	2	4	6		MAX. SHEAR STRESS psi	1.2	2.3	3.6		
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	TEST DURATION, (min)	469	469	469																																										
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CHANGE IN THICKNESS (%)	<table border="1"> <thead> <tr> <th>SHEAR VALUES</th> <th>ϕ°</th> <th>C_{psf}</th> </tr> </thead> <tbody> <tr> <td>AT MAXIMUM STRESS</td> <td>31^o</td> <td>0</td> </tr> </tbody> </table>					SHEAR VALUES	ϕ°	C_{psf}	AT MAXIMUM STRESS	31 ^o	0																																			
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SHEARING STRESS (τ) psi																																														
DISPLACEMENT (%)																																														
REMARKS																																														



MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST		
PROJECT and STATE <u>WEPP Woodward Soil</u>		SAMPLE LOCATION <u>Oklahoma</u>				
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN				
TYPE OF SAMPLE <u>COMPACTED</u>	TESTED AT <u>S.M.L., LINCOLN</u>	APPROVED BY			DATE	
CLASSIFICATION <u>CL-ML</u>		LL <u>25</u> PI <u>7</u>		SPECIFIC GRAVITY		
TYPE OF TEST <u>Consolidated Slow</u>			CONTROL STRAIN	$G_s(-)^{\#4}$	<u>2.61</u>	
RATE OF LOADING (in/min.) <u>0.00064</u>		MOISTURE CONDITION <u>FLOODED</u>		$G_s(+)^{\#4}$		
TYPE OF SPECIMEN <u>ROUND</u>		AREA (sq.in) <u>4.9</u>	THICKNESS (in) <u>1.0</u>	$G_m(\text{bulk})(+)^{\#4}$		
 	TEST NO.		1	2	3	4
	INIT MOISTURE, %		<u>8.39</u>	<u>8.39</u>	<u>8.39</u>	
	DRY DENSITY, $\frac{\text{g/cc}}{\text{pcf}}$		<u>1.41</u>	<u>1.41</u>	<u>1.41</u>	
	INIT VOID RATIO		<u>.8511</u>	<u>.8511</u>	<u>.8511</u>	
	TEST DURATION, (min)		<u>469</u>	<u>444</u>	<u>469</u>	
	FINAL MOISTURE, %		<u>24.8</u>	<u>23.5</u>	<u>22.3</u>	
	NORMAL STRESS, psi		<u>2</u>	<u>4</u>	<u>6</u>	
	MAX SHEAR STRESS, psi		<u>1.1</u>	<u>2.3</u>	<u>3.4</u>	
	SHEAR VALUES		ϕ	c		
AT MAXIMUM STRESS		<u>30°</u>	<u>0</u>			
REMARKS						



MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		DIRECT SHEAR TEST	
PROJECT and STATE <i>WEPP</i>		<i>Zahl So. 1</i>		SAMPLE LOCATION <i>ND</i>	
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE <i>COMPACTED</i>	TESTED AT <i>S.M.L., LINCOLN</i>	APPROVED BY			DATE
CLASSIFICATION		LL	PI	SPECIFIC GRAVITY	
TYPE OF TEST <i>Consolidated Slow</i>		CONTROL STRAIN		$G_s(-)^{\#4}$	
RATE OF LOADING (in/min.) <i>0.00064</i>		MOISTURE CONDITION <i>FLOODED</i>		$G_s(+)^{\#4}$	
TYPE OF SPECIMEN <i>ROUND</i>		AREA (sq.in) <i>4.9</i>	THICKNESS (in) <i>1.0</i>	$G_m(\text{bulk})(+)^{\#4}$	
<p>Y-axis: Shearing Stress (τ)</p> <p>X-axis: Displacement (%)</p>	TEST NO.	1	2	3	4
	INIT MOISTURE, %	16.7	16.7	16.7	
	DRY DENSITY, $\frac{\text{g}}{\text{cc}}$	1.25	1.25	1.25	
	INIT VOID RATIO				
	TEST DURATION, (min)	456	459	469	
	FINAL MOISTURE, %	30.2	25.1	26.2	
	NORMAL STRESS, psi	2	4	6	
	MAX. SHEAR STRESS, psi	1.4	2.4	3.4	
SHEAR VALUES		ϕ	c		
AT MAXIMUM STRESS		27°	50 psf		
<p>Y-axis: Shearing Stress (τ) psi</p> <p>X-axis: Normal Stress (σ) psi</p>	REMARKS				



Unconfined Compression Test Data

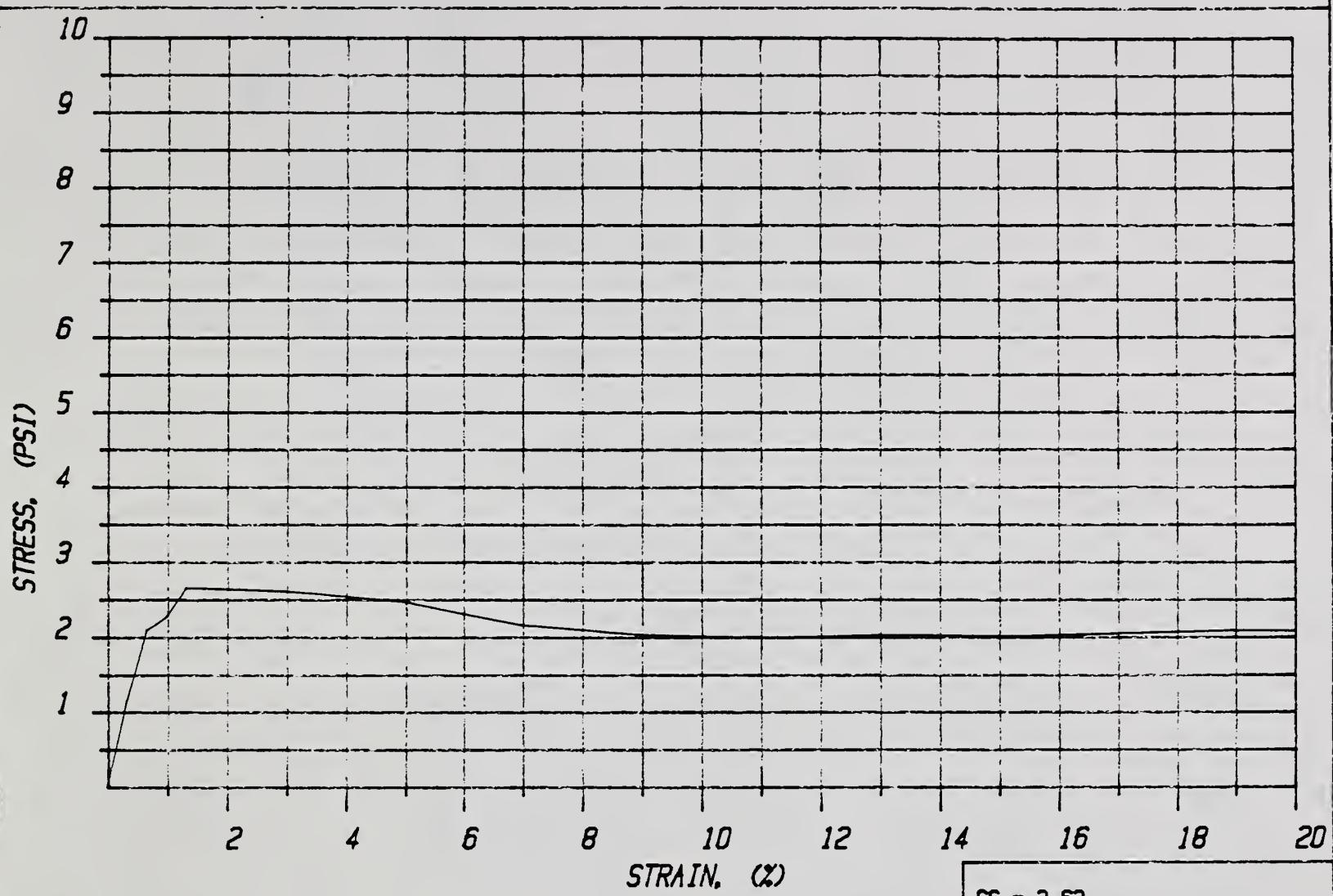


UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 89

PROJECT: WEPP - ABILENE SOIL - TEXAS

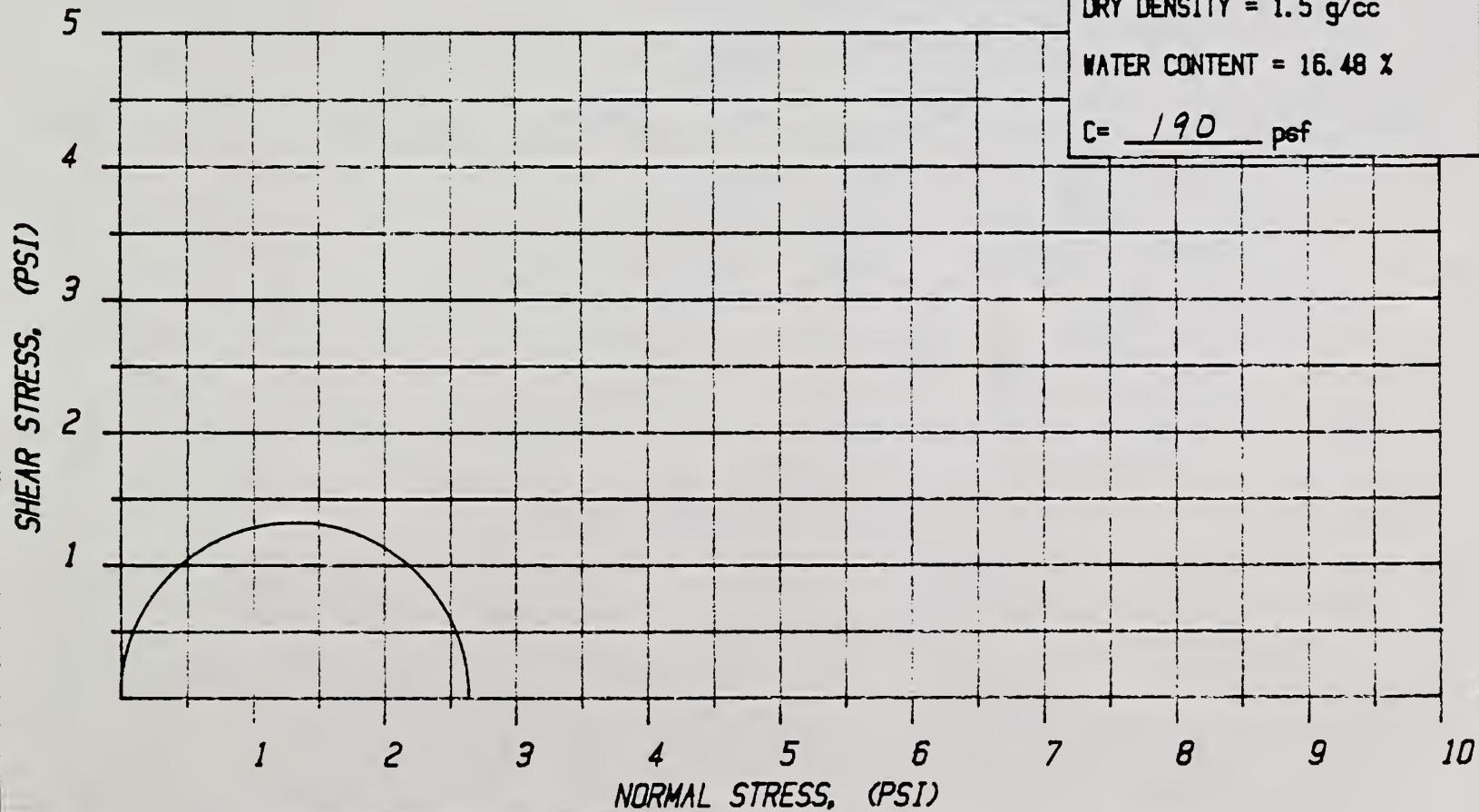


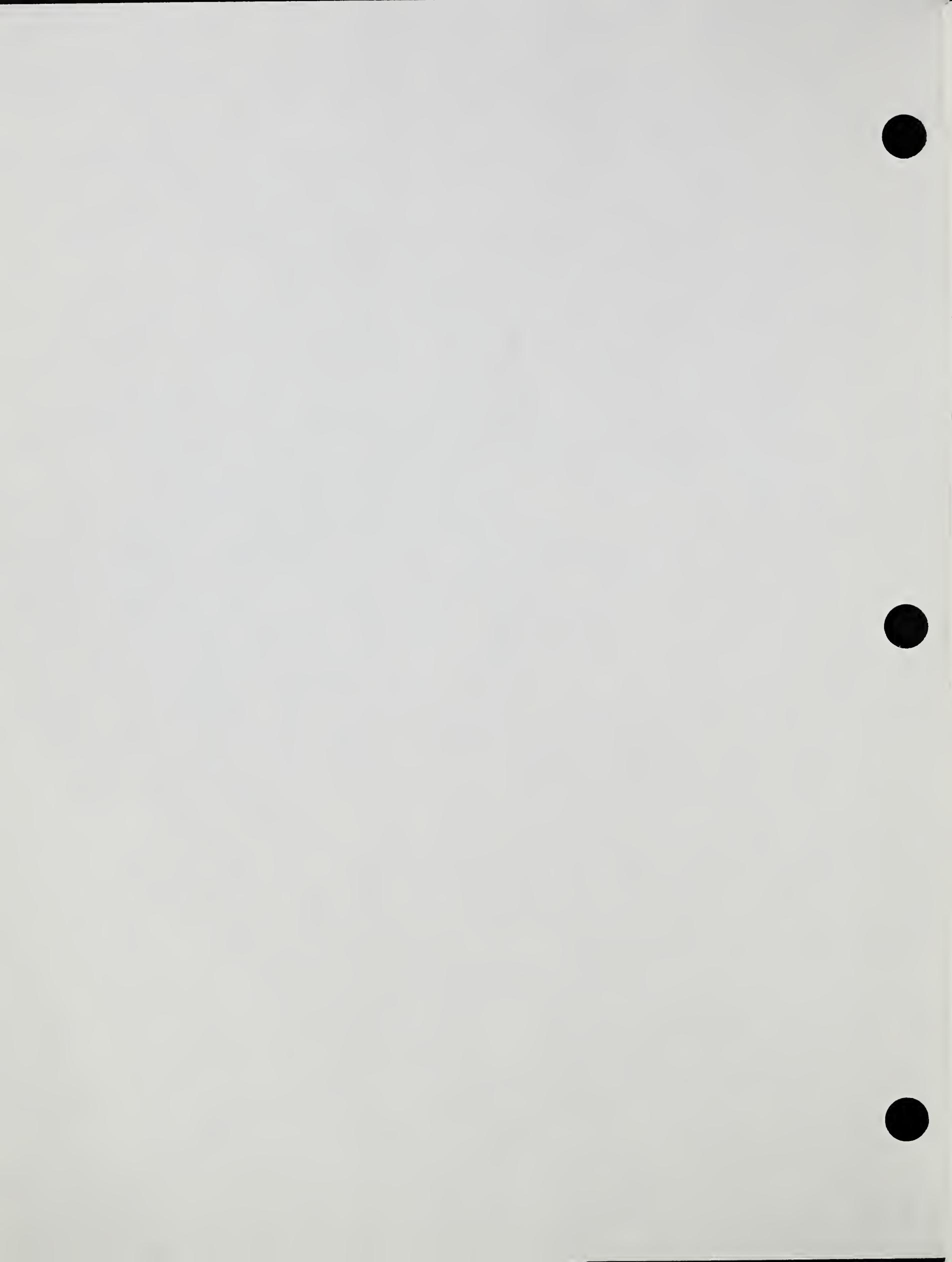
GS = 2.63

DRY DENSITY = 1.5 g/cc

WATER CONTENT = 16.48 %

C = 190 psf



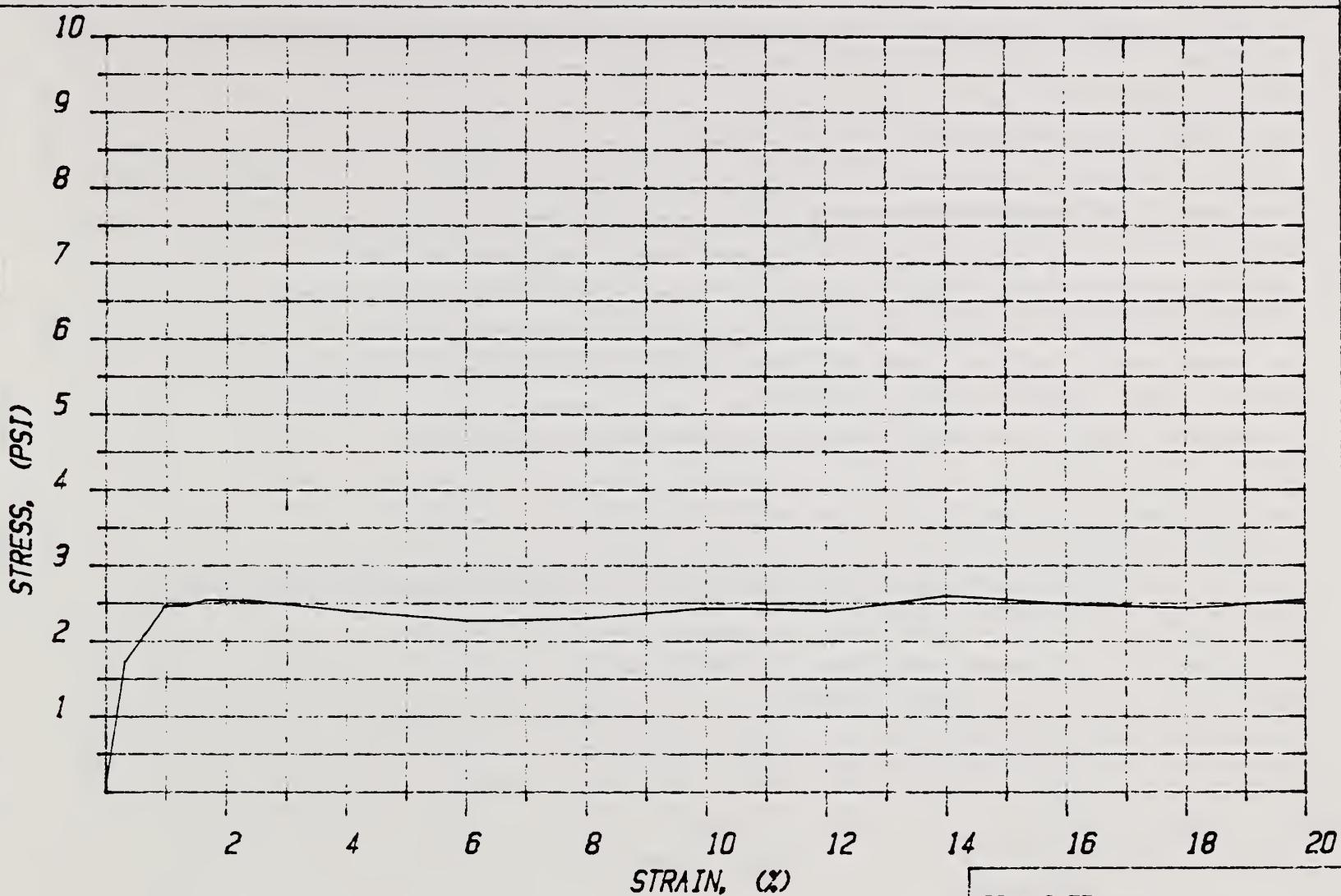


UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 90

PROJECT: WEPP - ACADEMY SOIL - FRESNO CA.

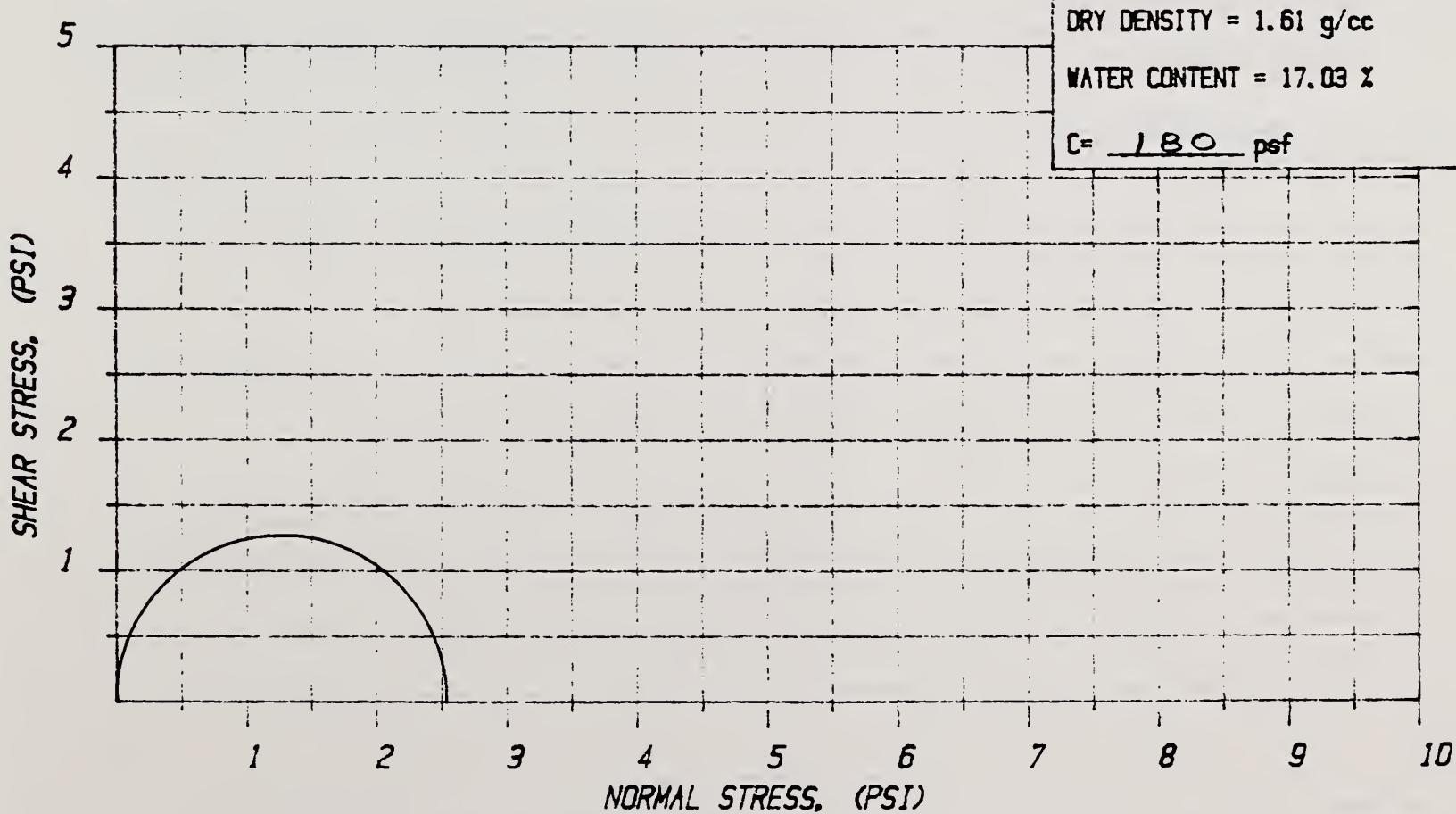


GS = 2.75

DRY DENSITY = 1.61 g/cc

WATER CONTENT = 17.03 %

C = 180 psf



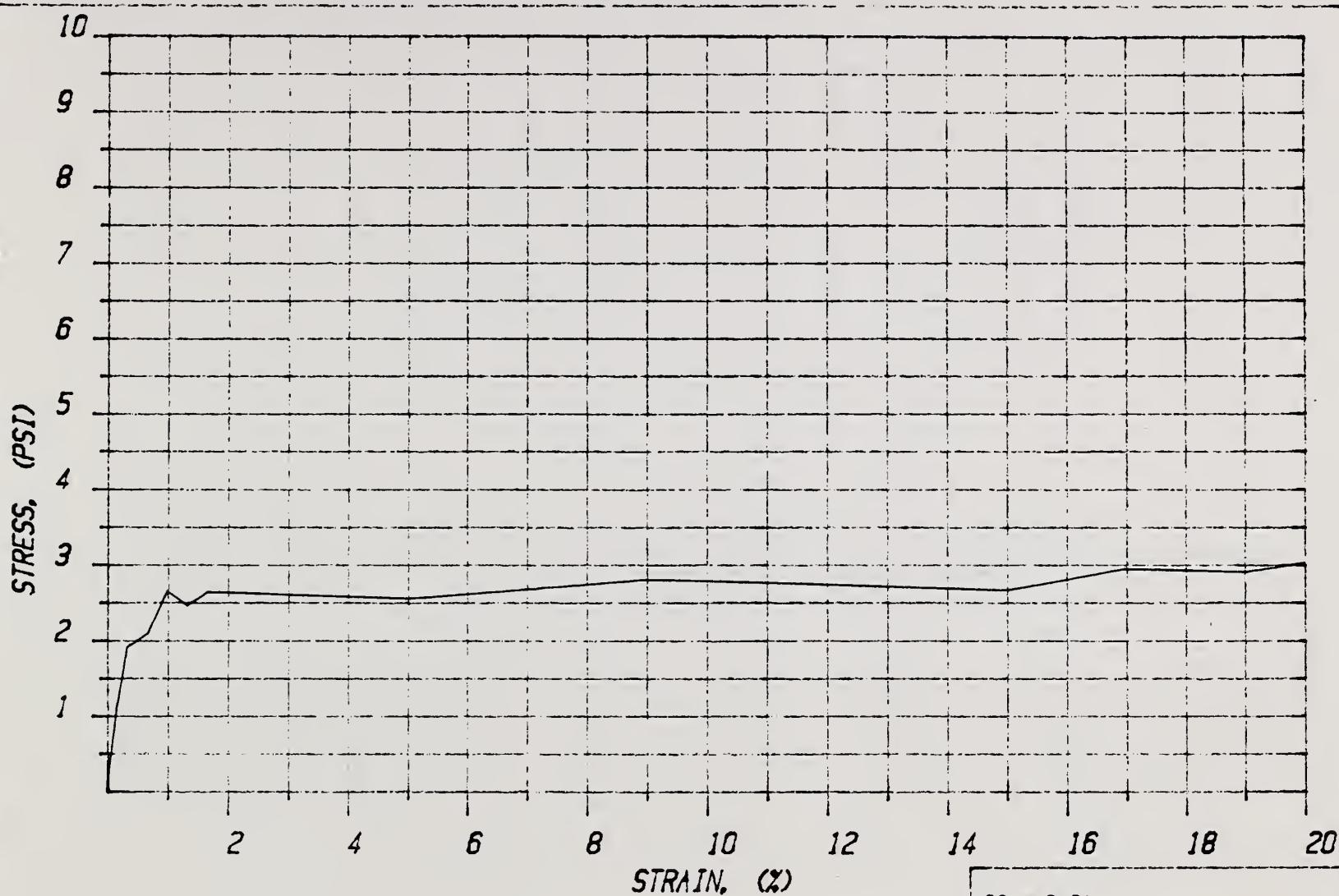


UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 91

PROJECT: WEPP - BARNES SOIL - MORRIS MN.

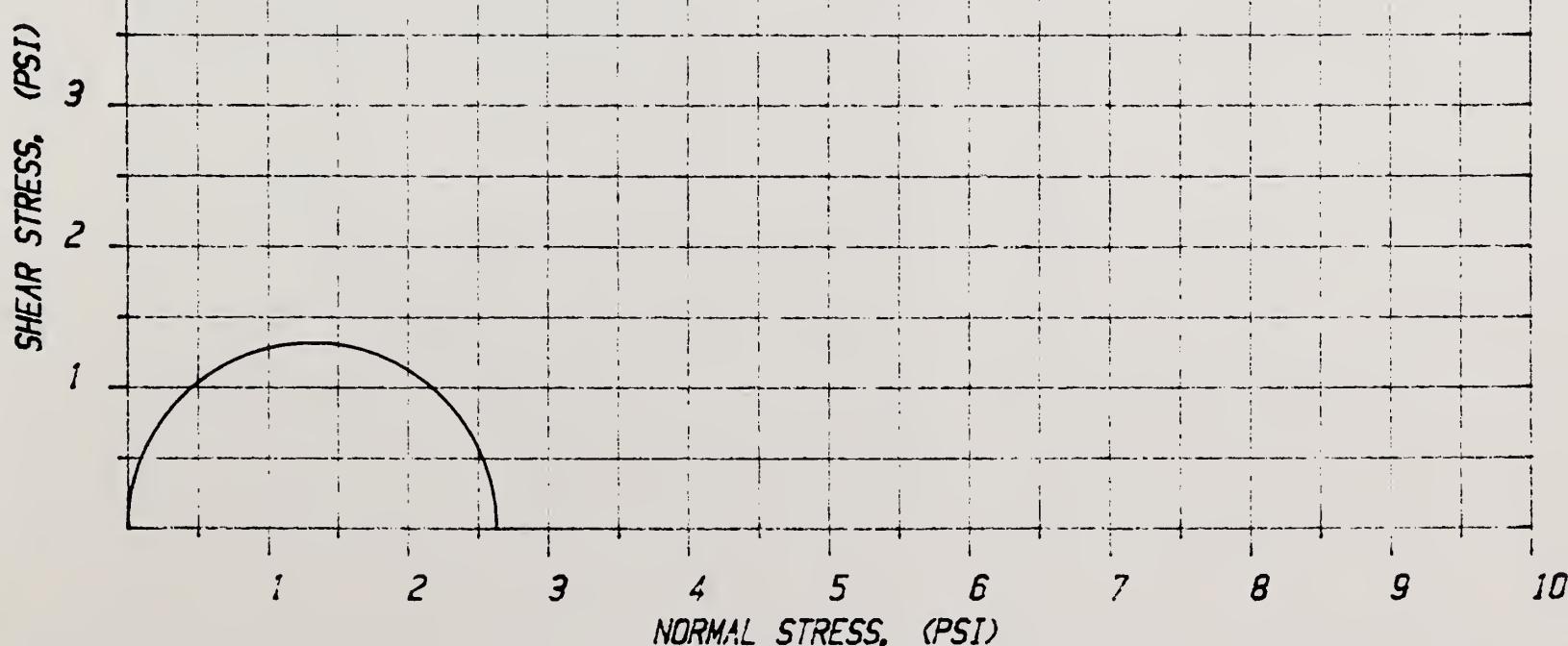


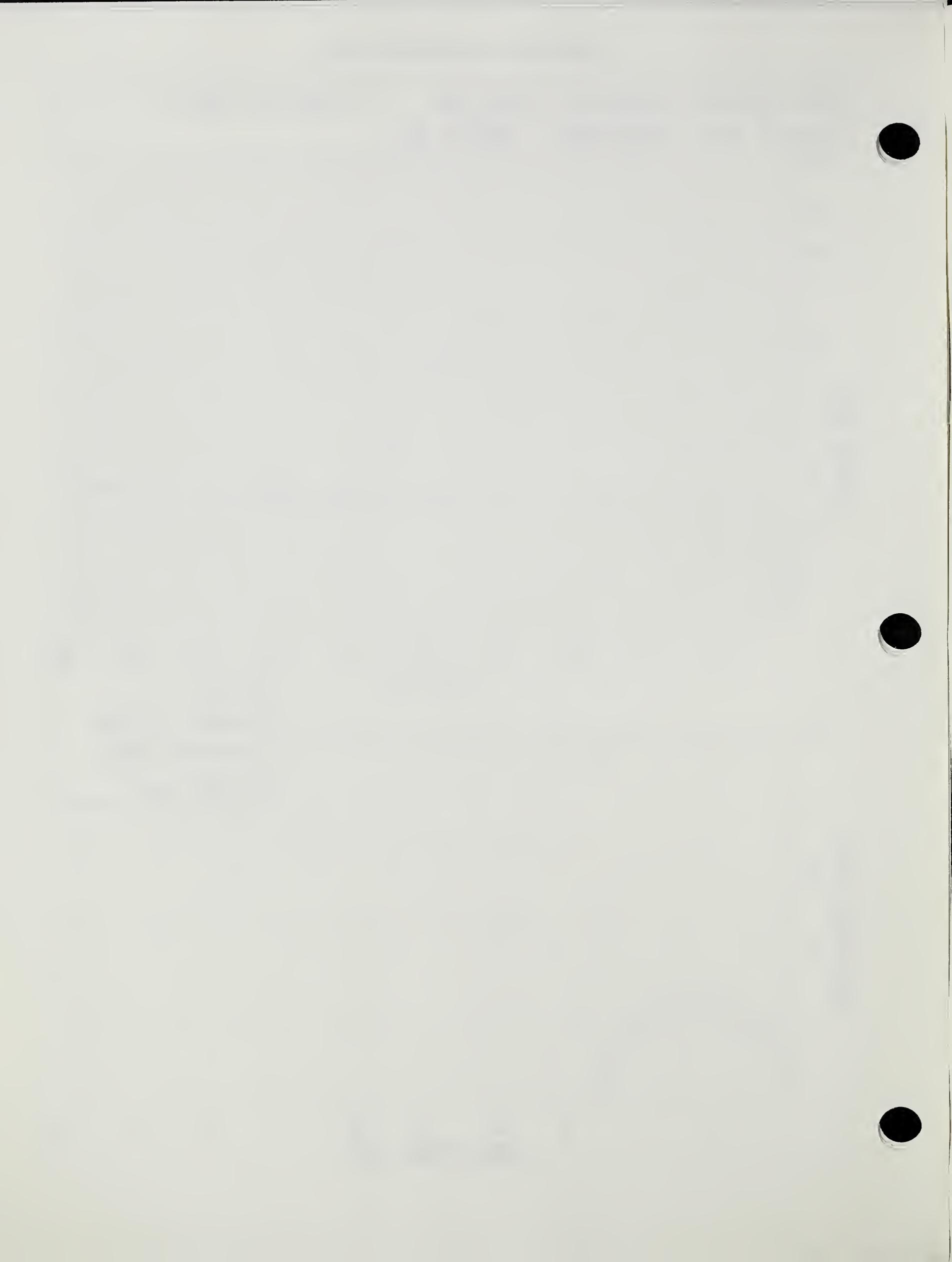
GS = 2.61

DRY DENSITY = 1.14 g/cc

WATER CONTENT = 26.62 %

C = 190 pcf



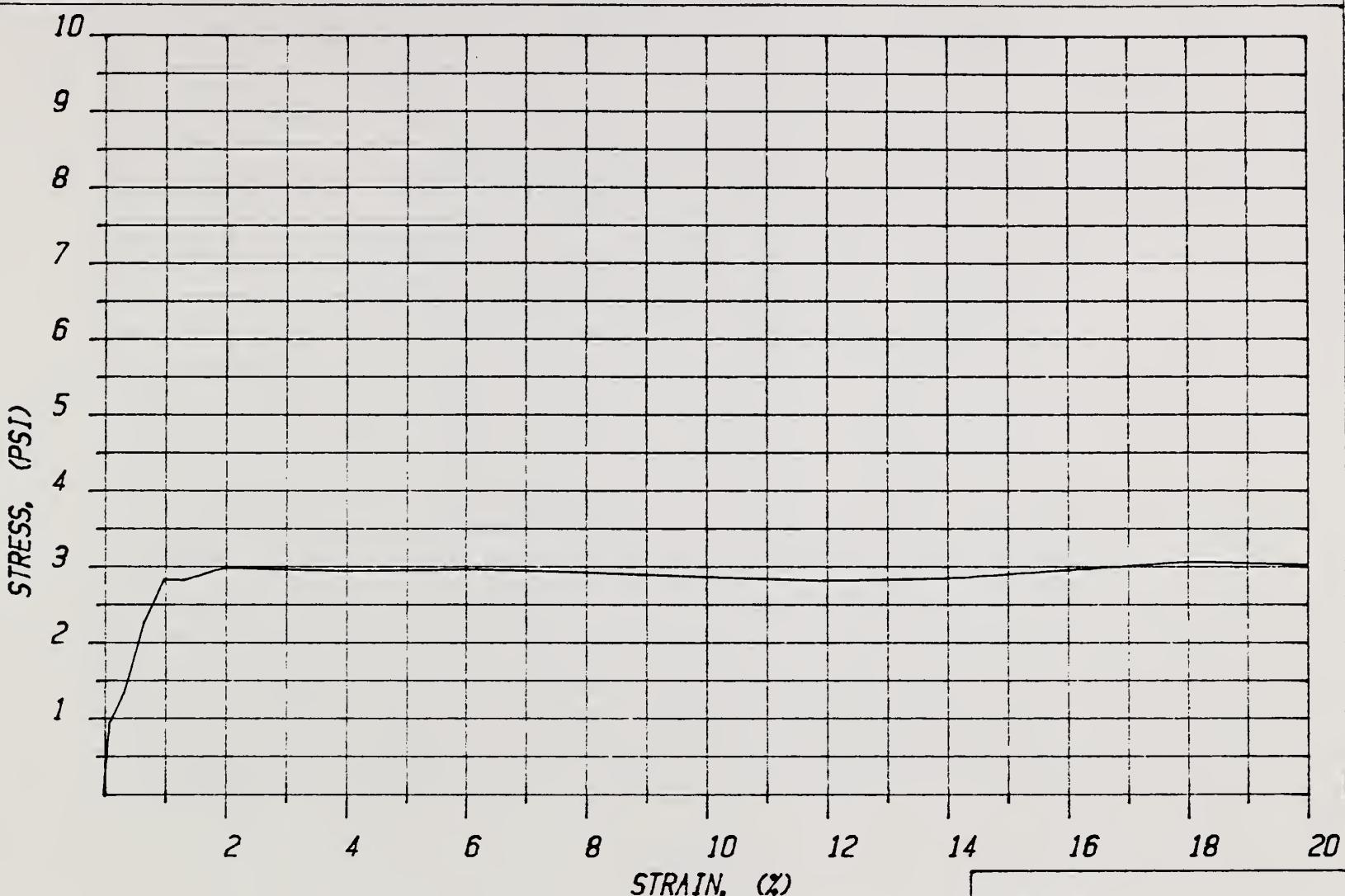


UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 92

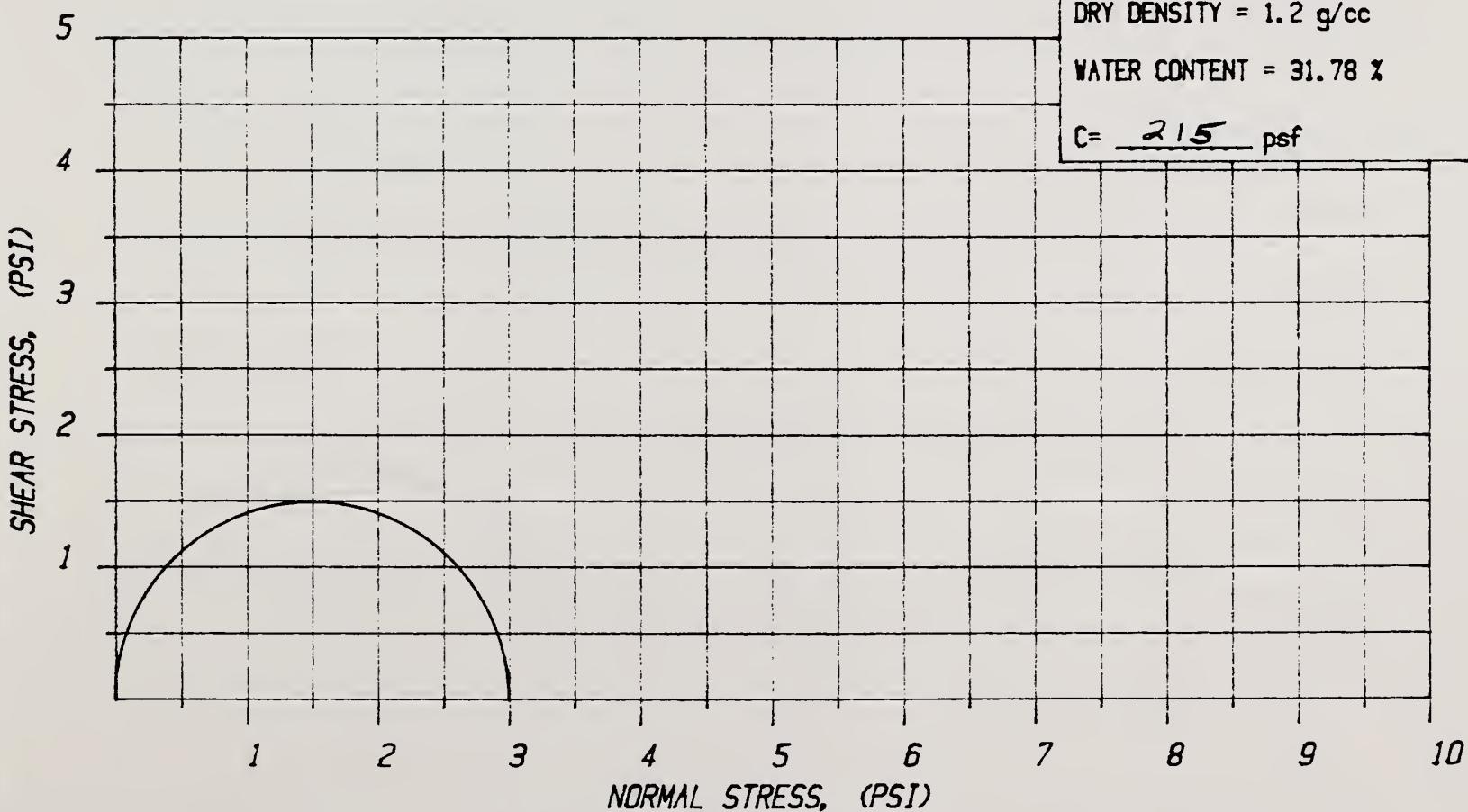
PROJECT: WEPP - BARNES SOIL - McCLUSKY ND.

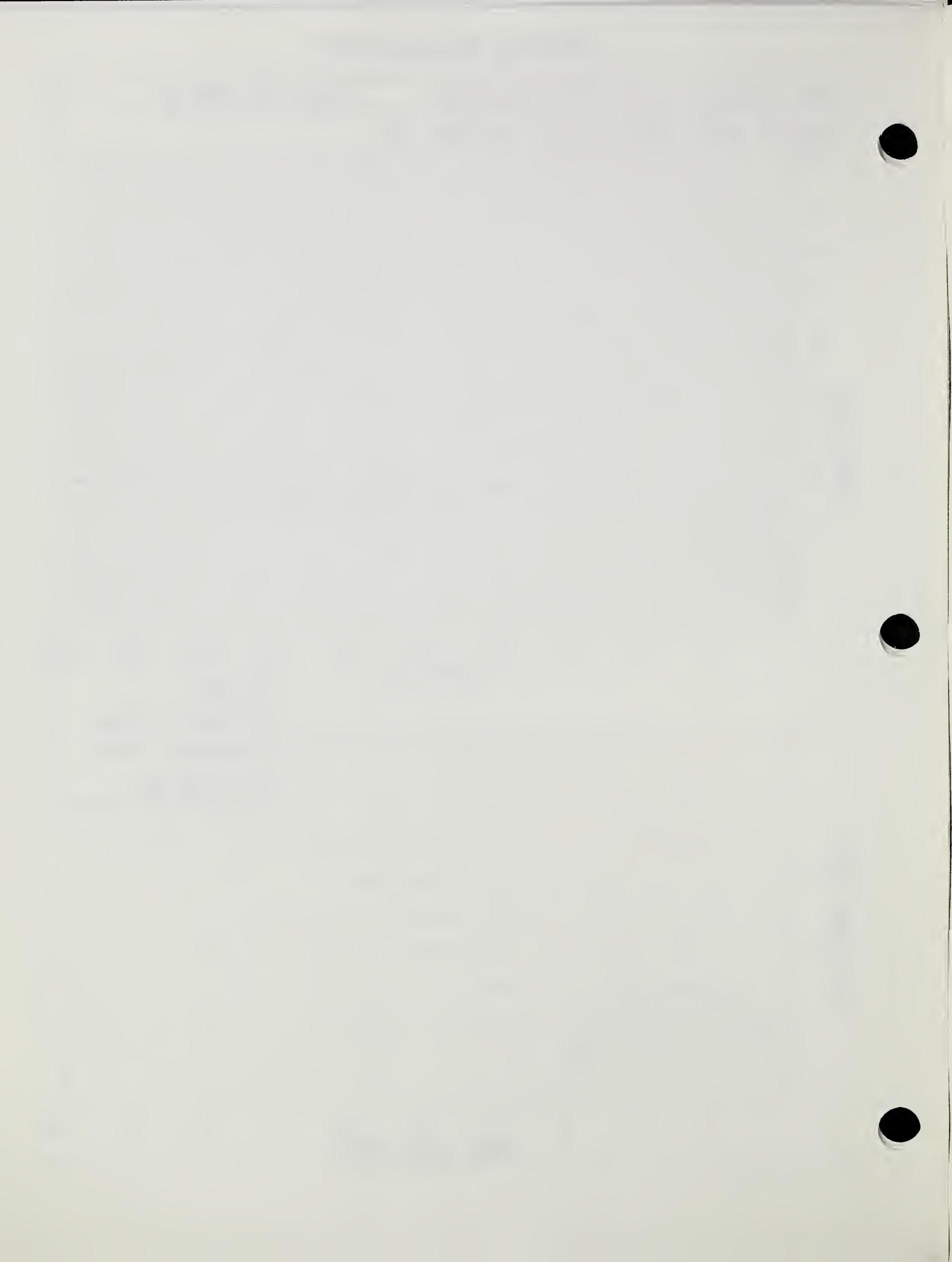


GS = 2.55

DRY DENSITY = 1.2 g/cc

WATER CONTENT = 31.78 %

C = 215 psf

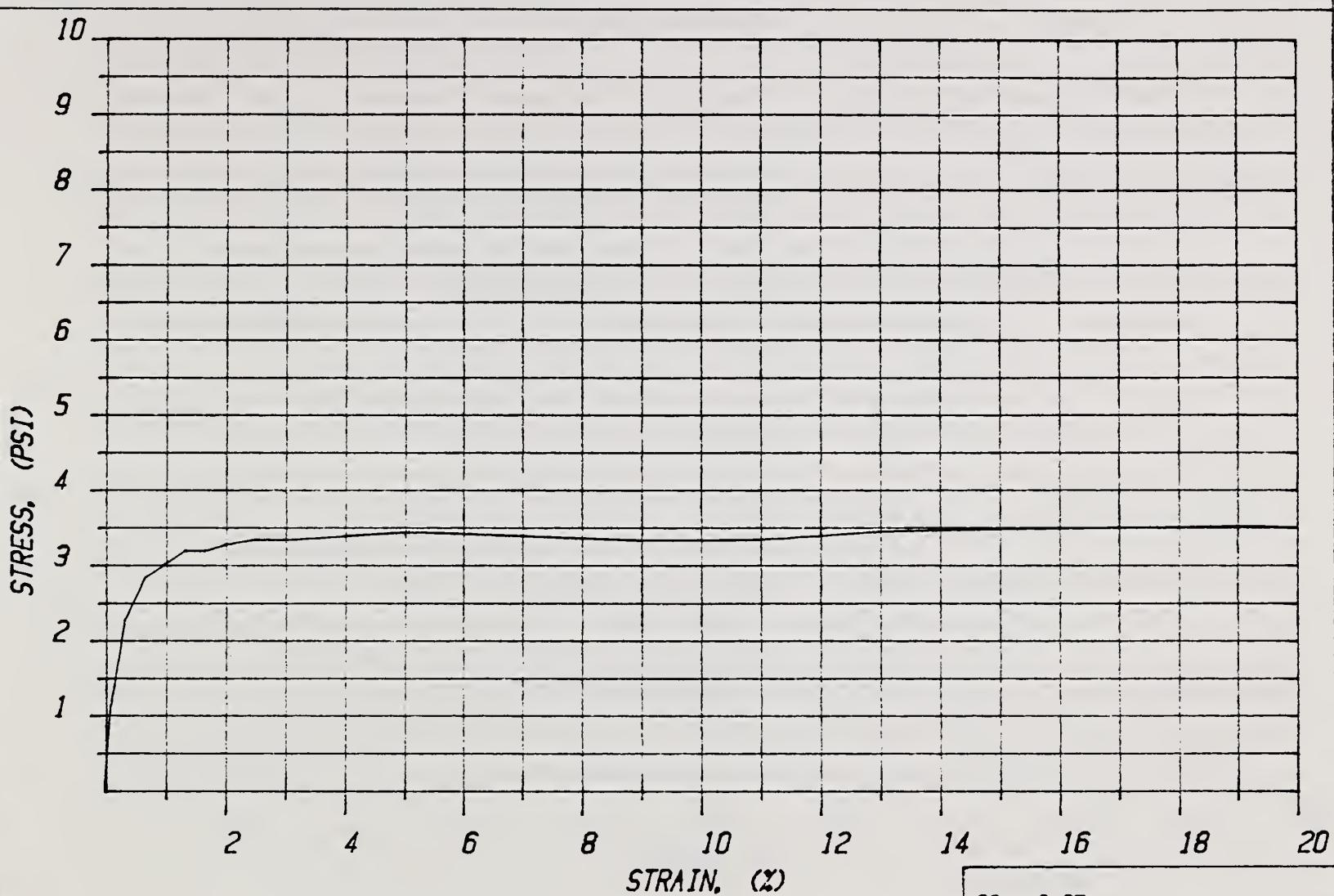


UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 93

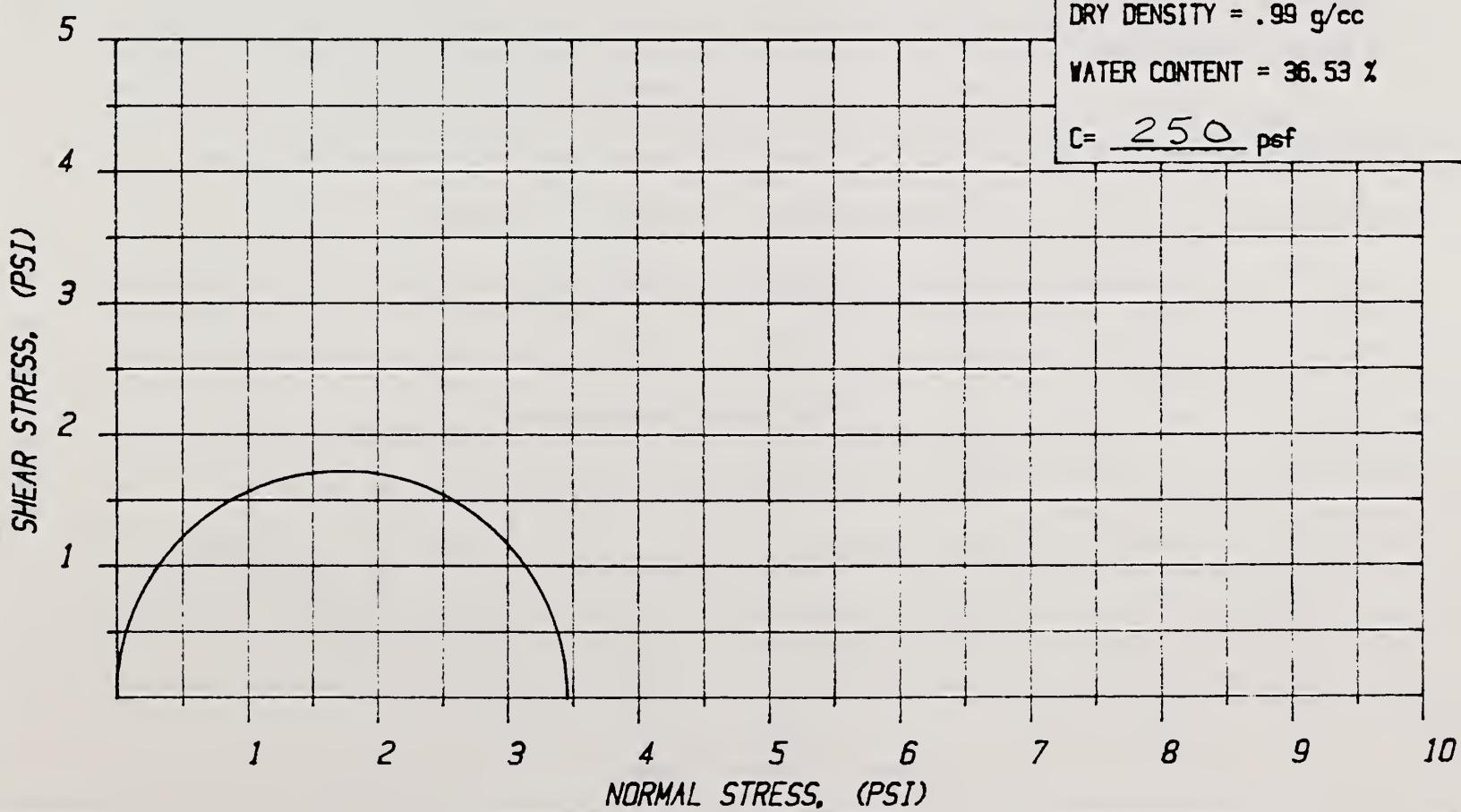
PROJECT: WEPP - HEIDEN SOIL - WACO TX.

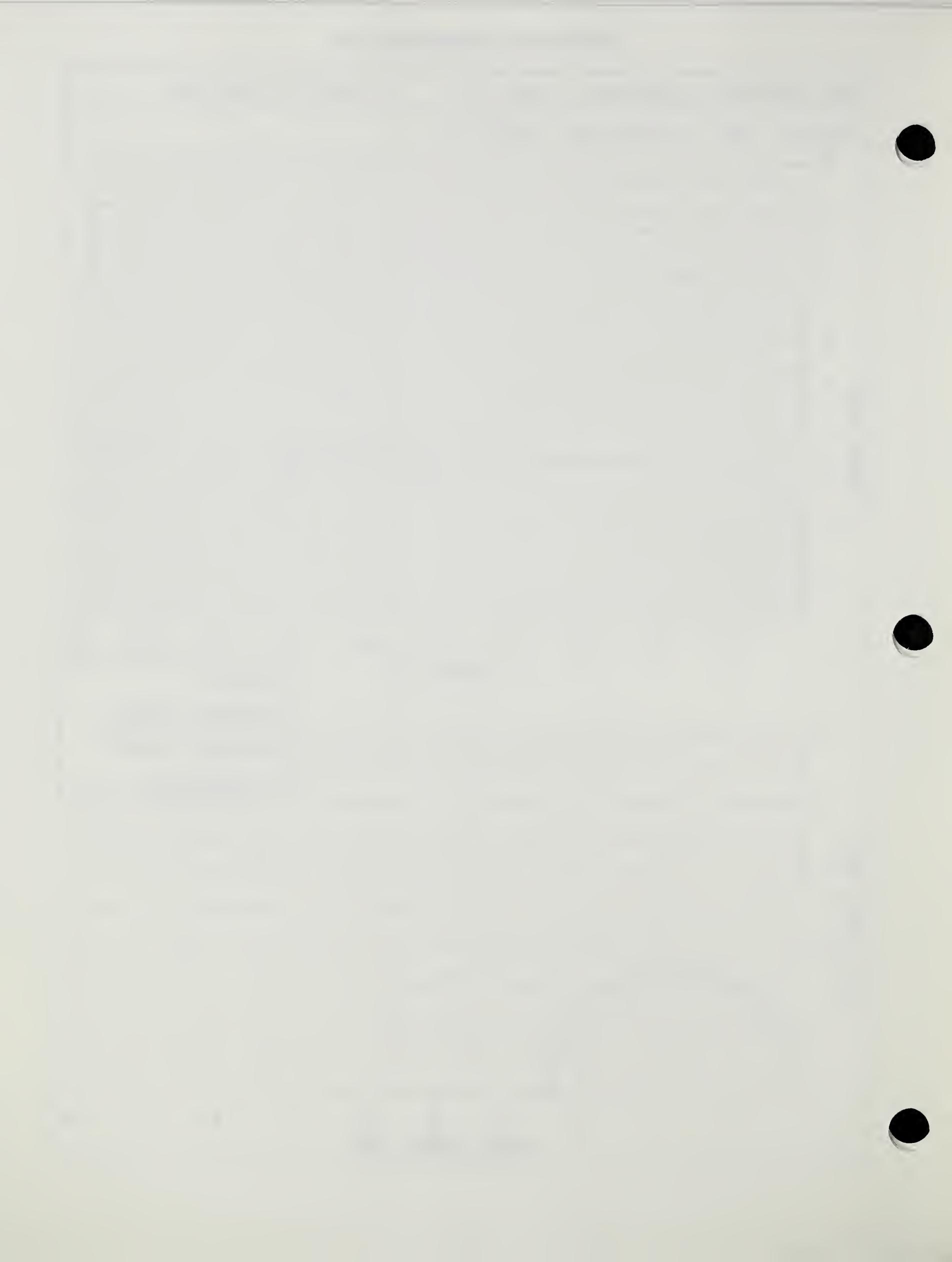


GS = 2.67

DRY DENSITY = .99 g/cc

WATER CONTENT = 36.53 %

C = 250 psf

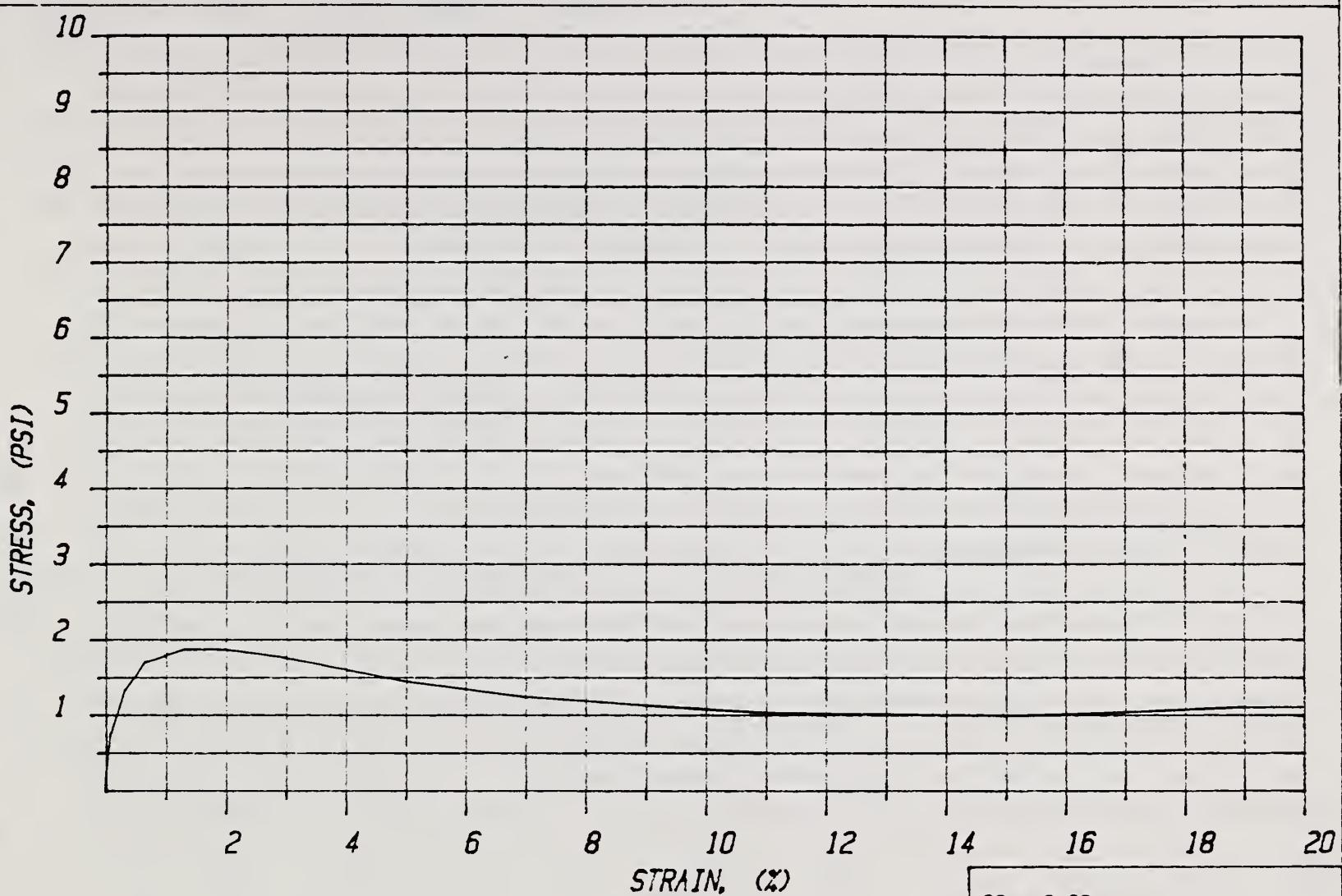


UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 94

PROJECT: WEPP - HIRSH SOIL - ORD NE.

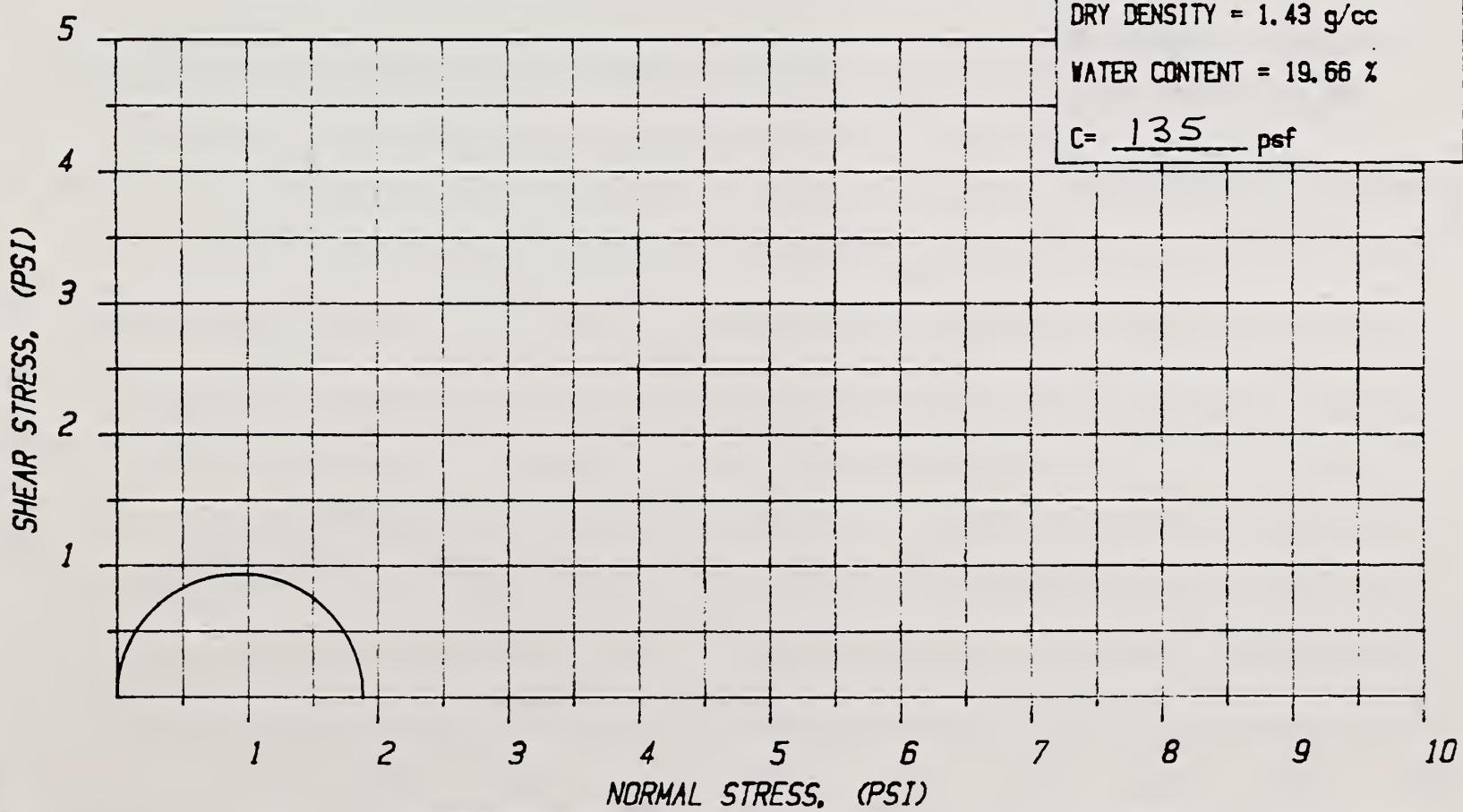


GS = 2.63

DRY DENSITY = 1.43 g/cc

WATER CONTENT = 19.66 %

C = 135 psf



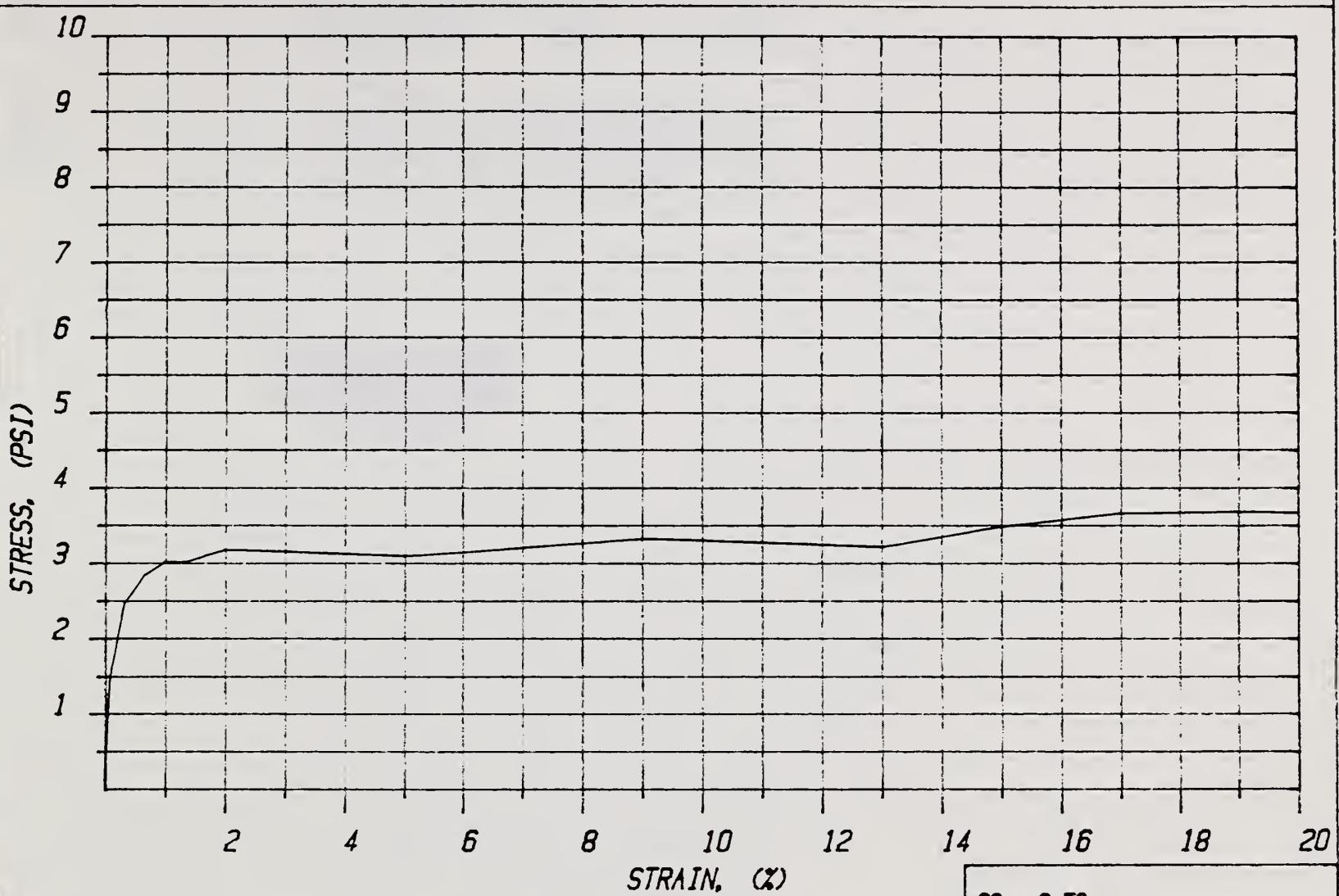


UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 95

PROJECT: WEPP - KEITH SOIL - ALBIN WY.

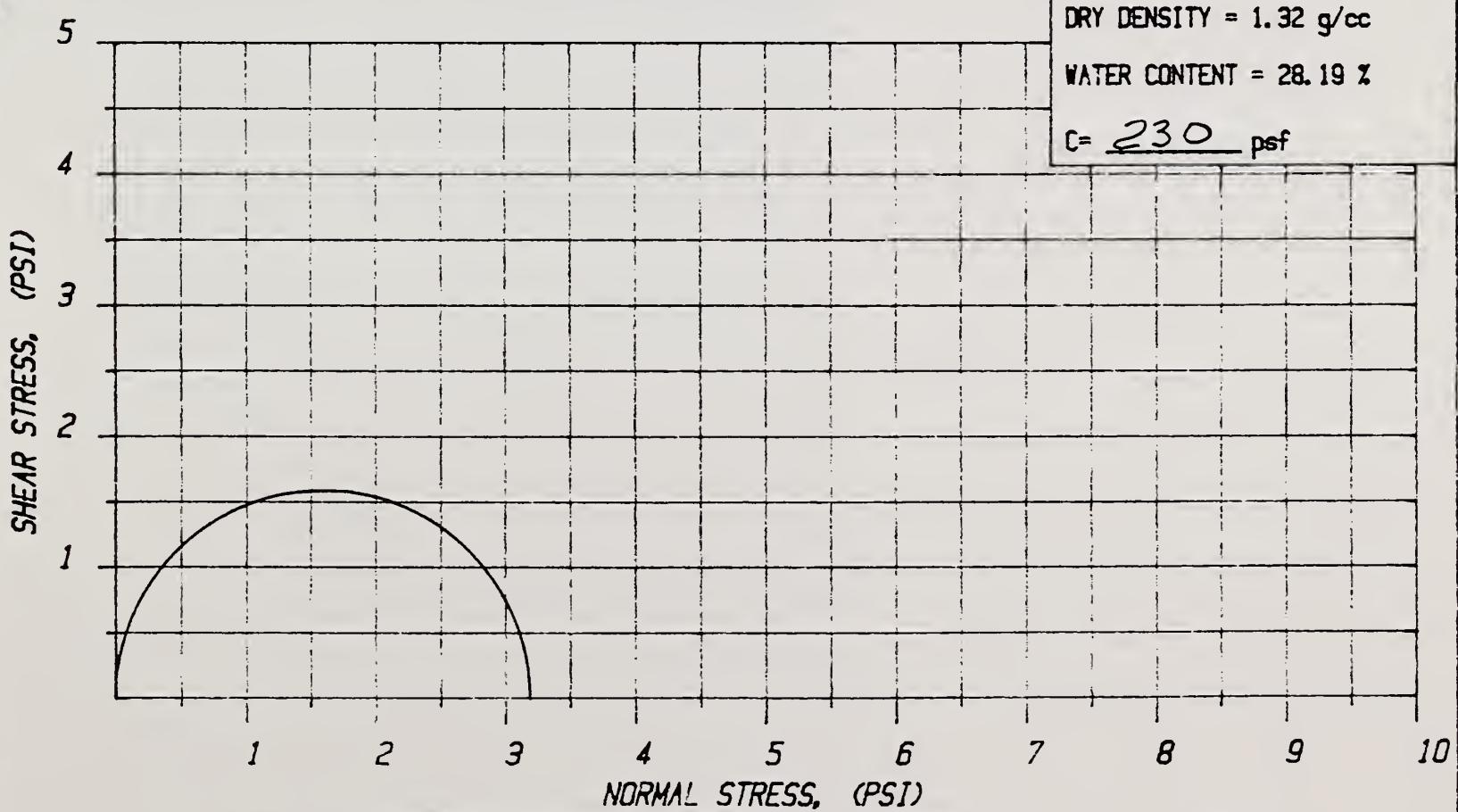


GS = 2.59

DRY DENSITY = 1.32 g/cc

WATER CONTENT = 28.19 %

C = 230 psf





Tag	Ind 1	Ind 2	Field Data
000			00380cam__22001095i_4500
001			935968
005			20050420123734.0
006			a_____001_0_
008			050420s1987____nbua_____000_0_eng_d
040			#a AGLG
245	1		#a WEPP 1987 cropland samples : #b soil mechanics tests.
260			#a Lincoln, NE : #b USDA, Soil Conservation Service, Midwest National Technical Center, Soil Mechanics Laboratory, #c 1987.

NATIONAL AGRICULTURAL LIBRARY



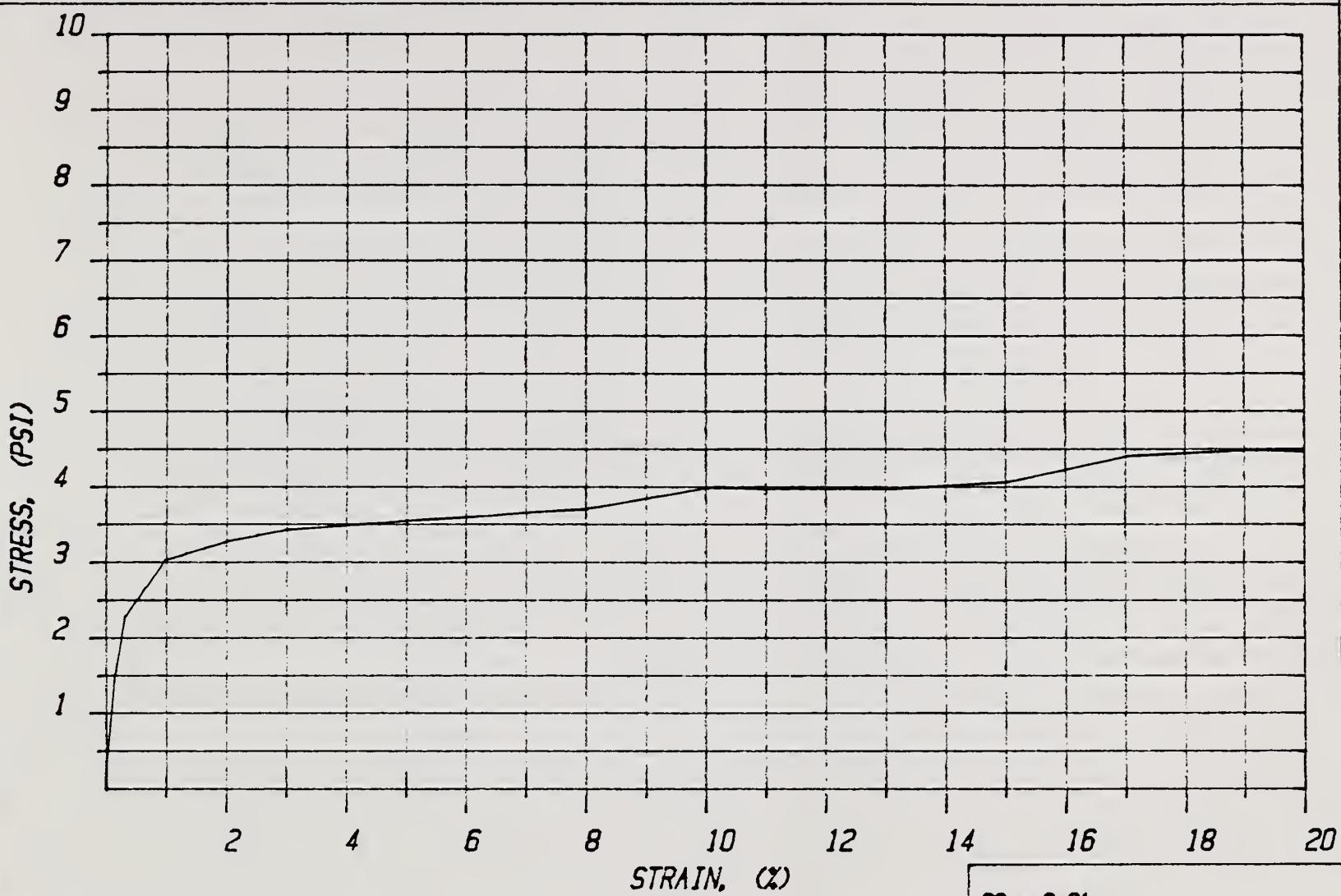
1022556514

UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 96

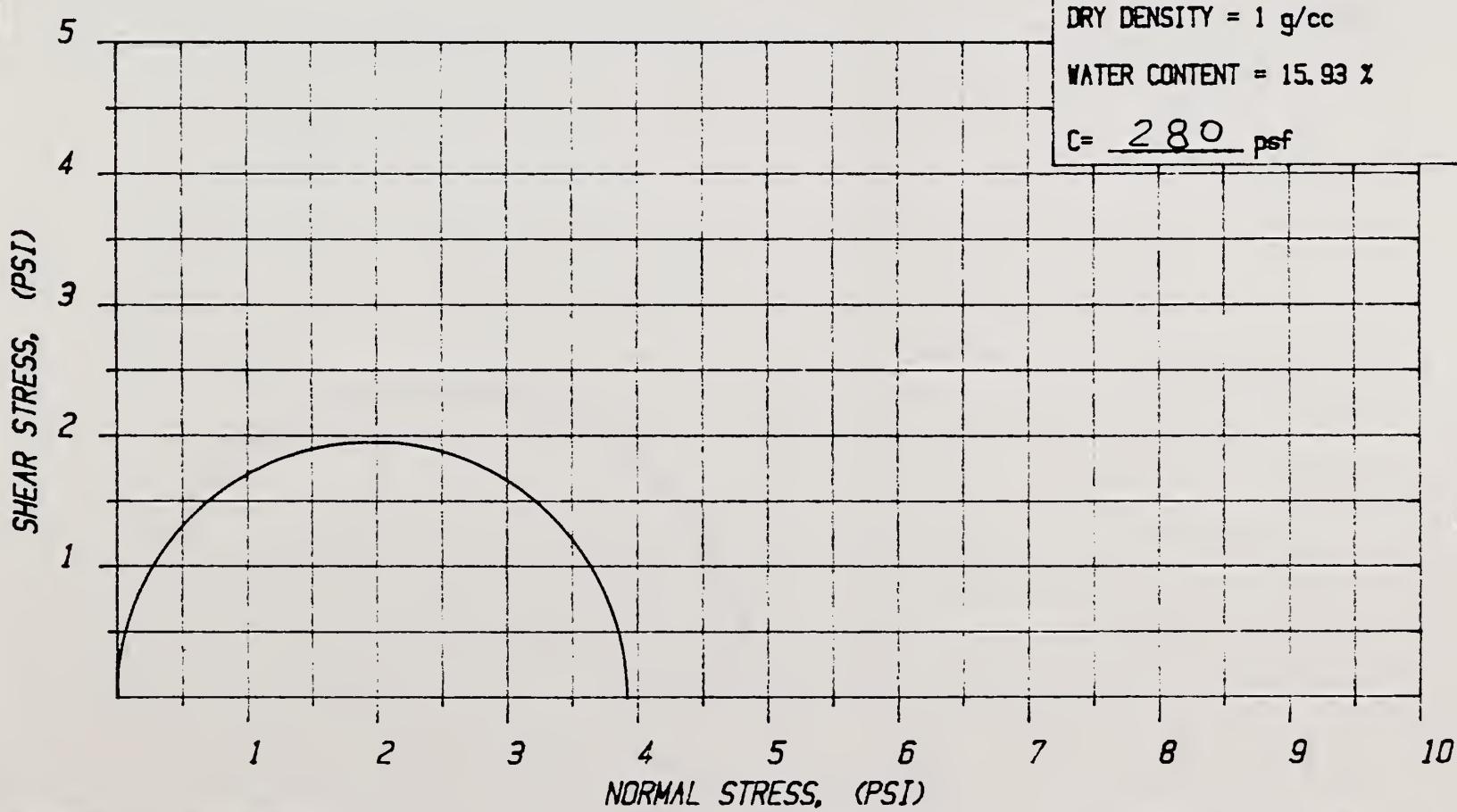
PROJECT: WEPP - LOS BANOS SOIL - FRESNO CA.



GS = 2.61

DRY DENSITY = 1 g/cc

WATER CONTENT = 15.93 %

C = 280 psf

(

(

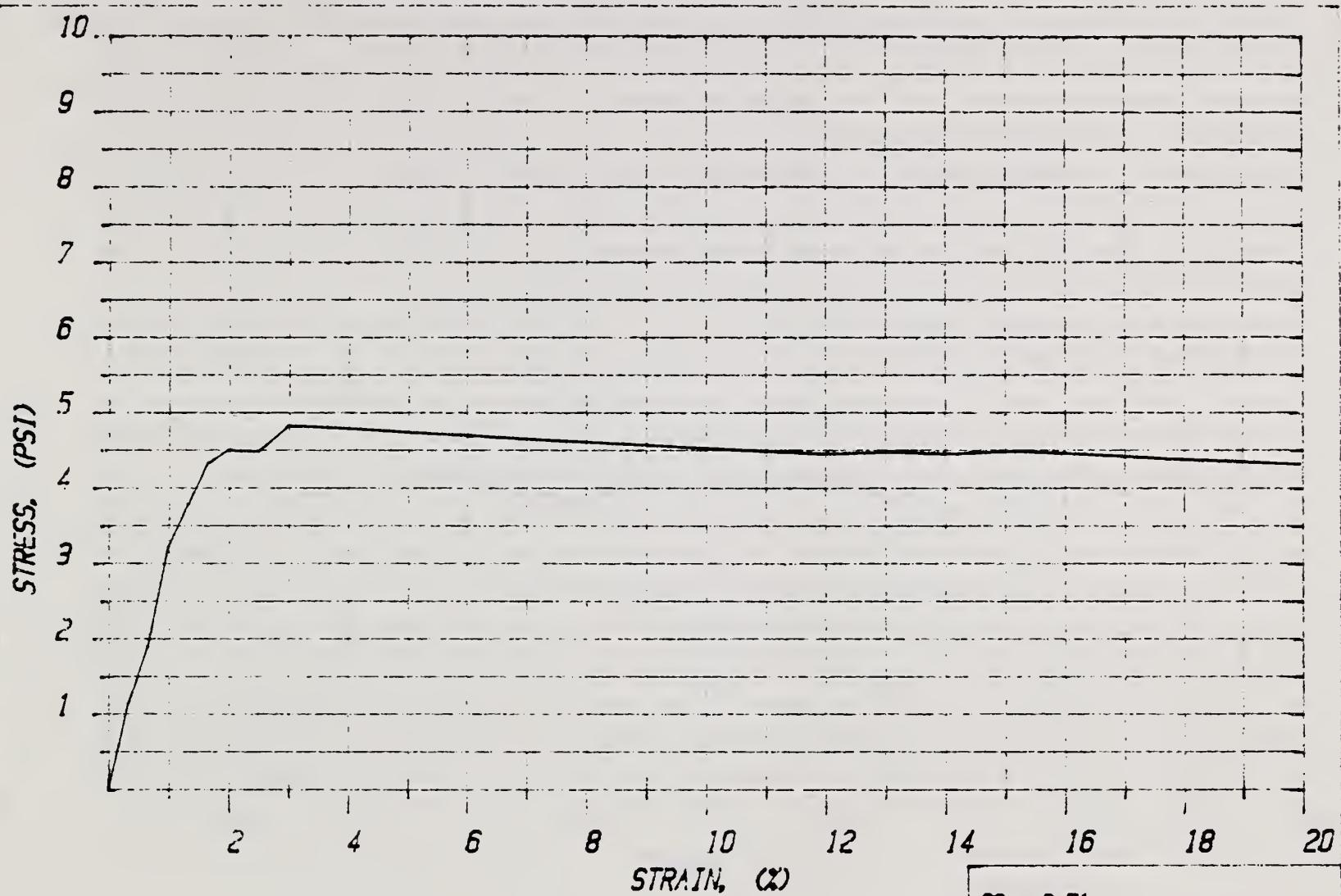
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UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C97

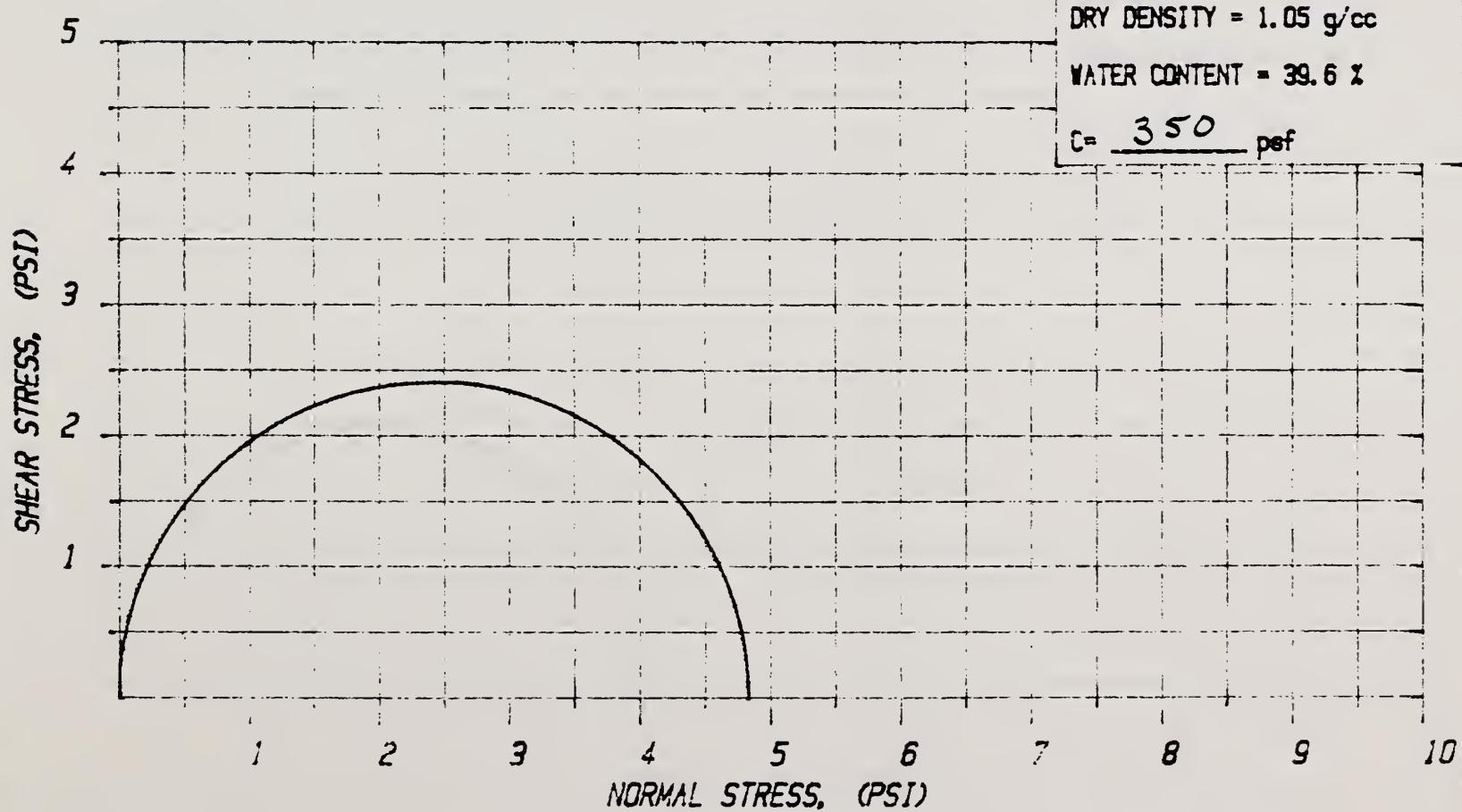
PROJECT: WEPP - PIERRE SOIL - COTTONWOOD SD.



GS = 2.71

DRY DENSITY = 1.05 g/cc

WATER CONTENT = 39.6 %

c = 350 pcf

(

(

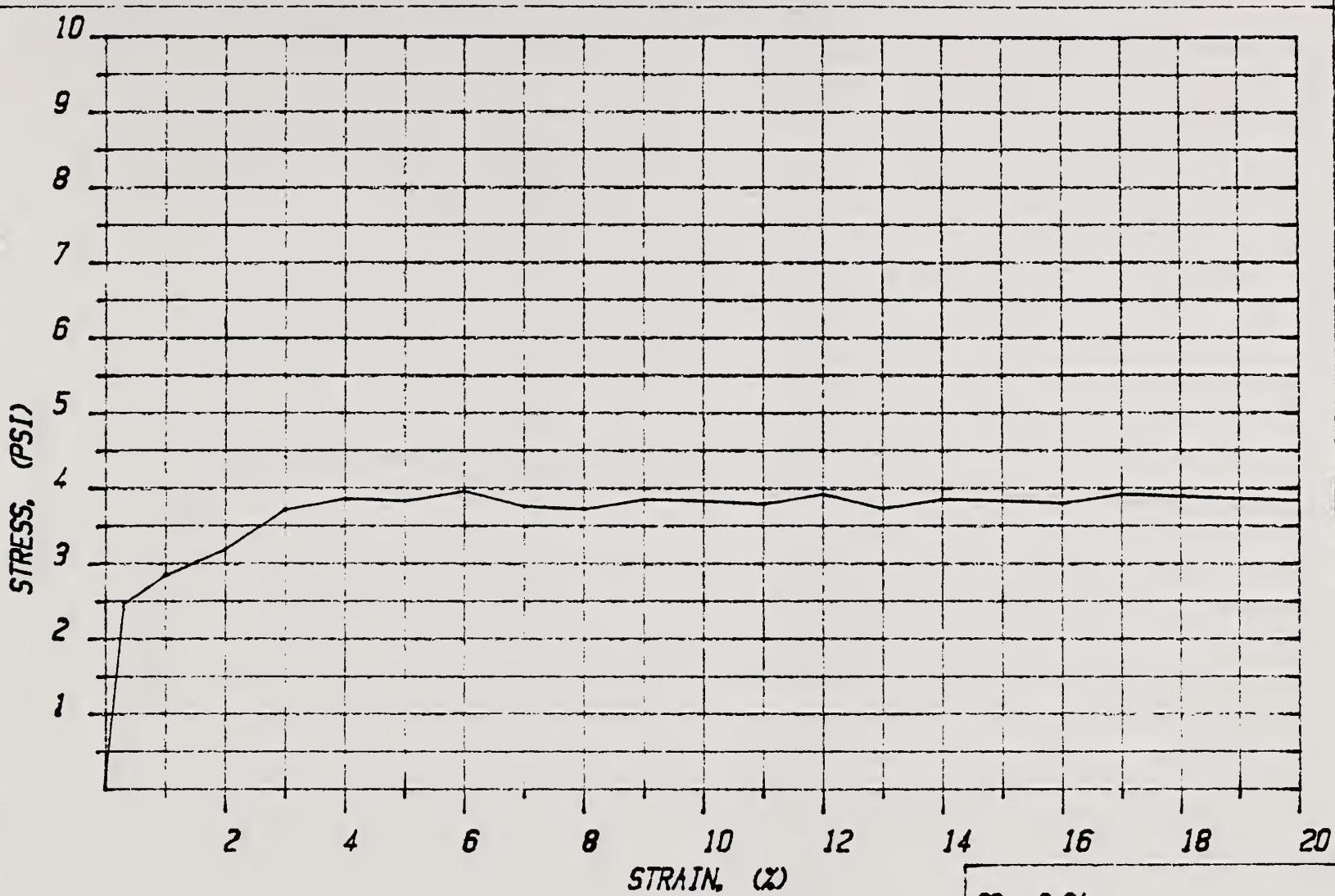
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UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 99C98

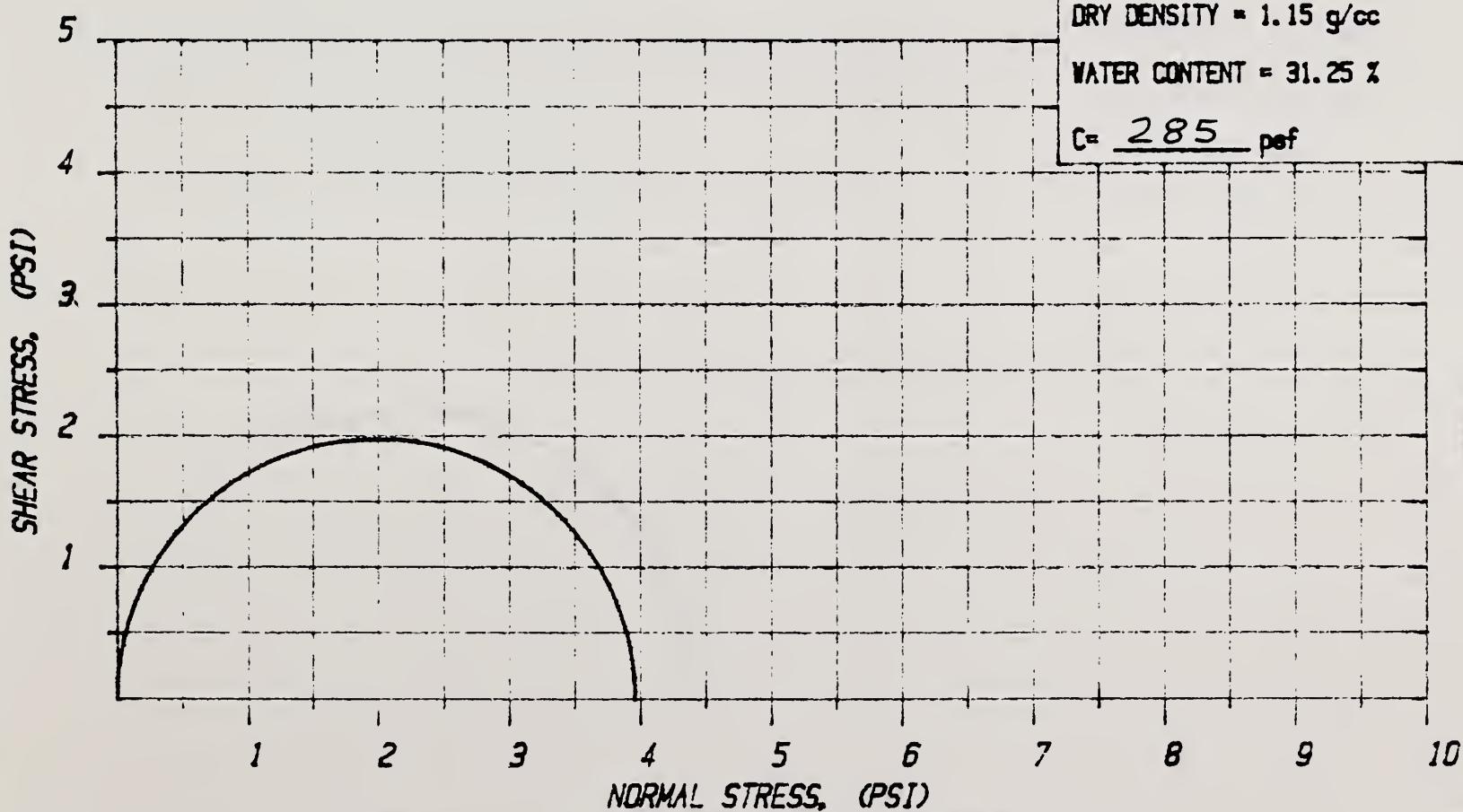
PROJECT: WEPP - PALOUSE SOIL - PULLMAN WA.



GS = 2.64

DRY DENSITY = 1.15 g/cc

WATER CONTENT = 31.25 %

c = 285 pcf

(

(

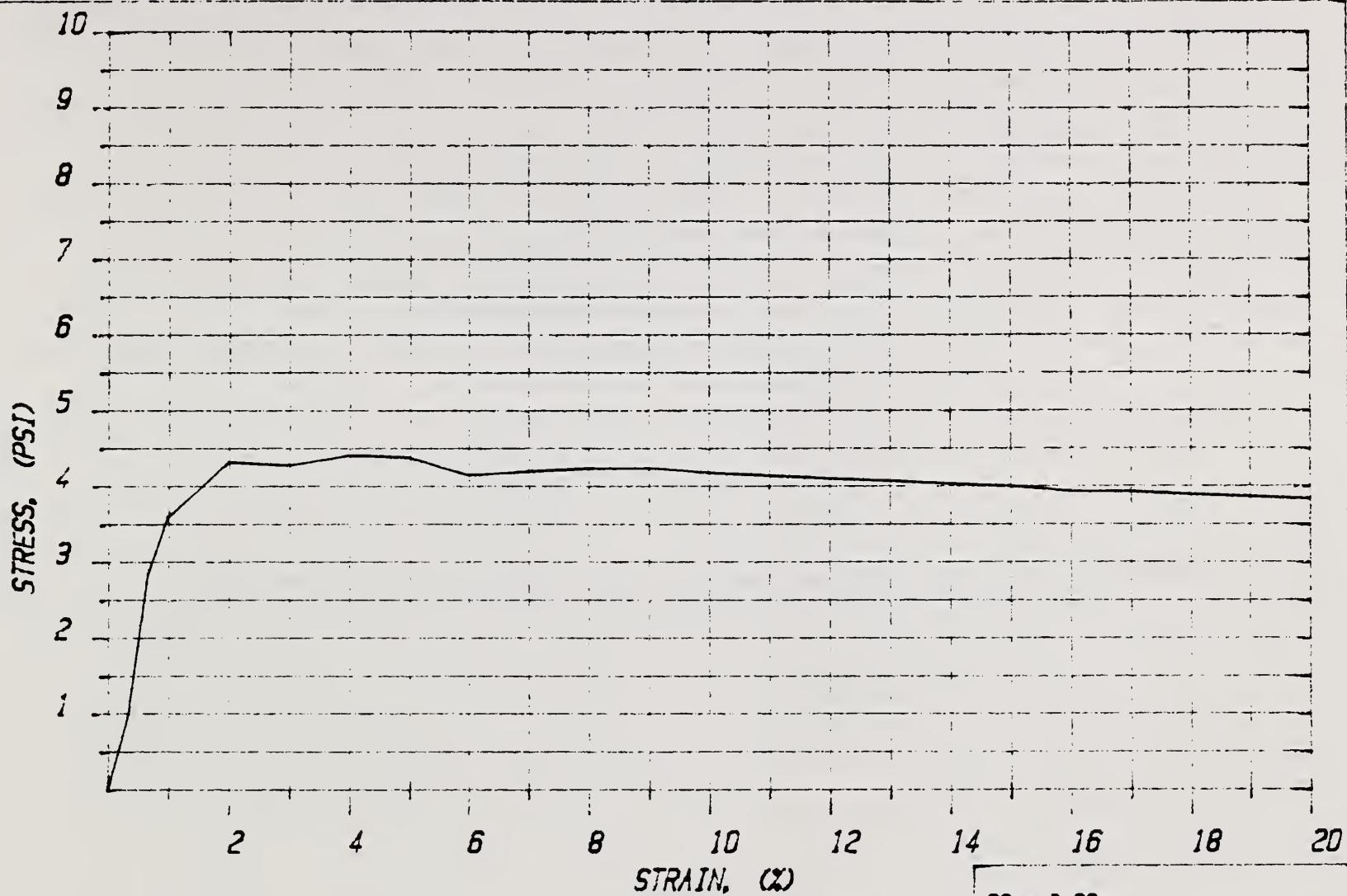
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UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C99

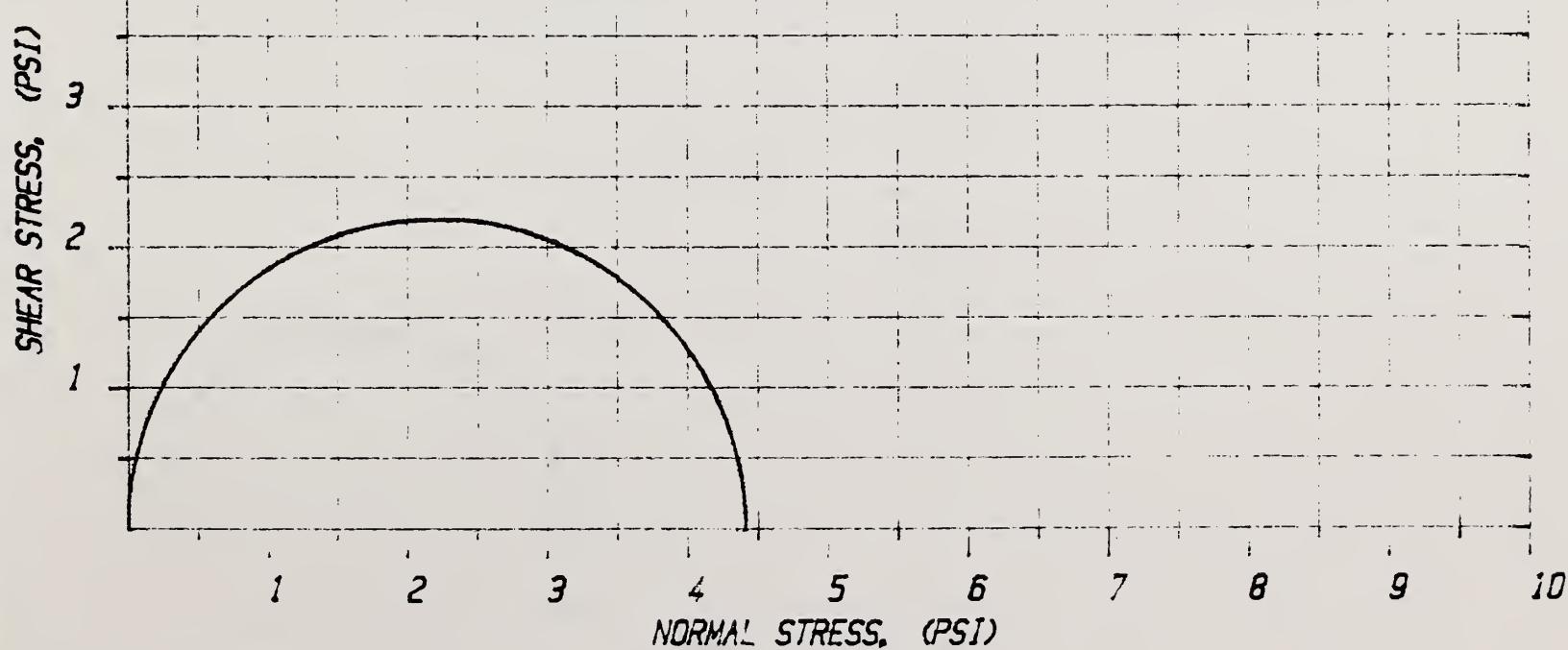
PROJECT: WEPP - PORTNEUF SOIL - KIMBERLY ID.



GS = 2.66

DRY DENSITY = 1.25 g/cc

WATER CONTENT = 31.7 %

c = 315 psf

(

(

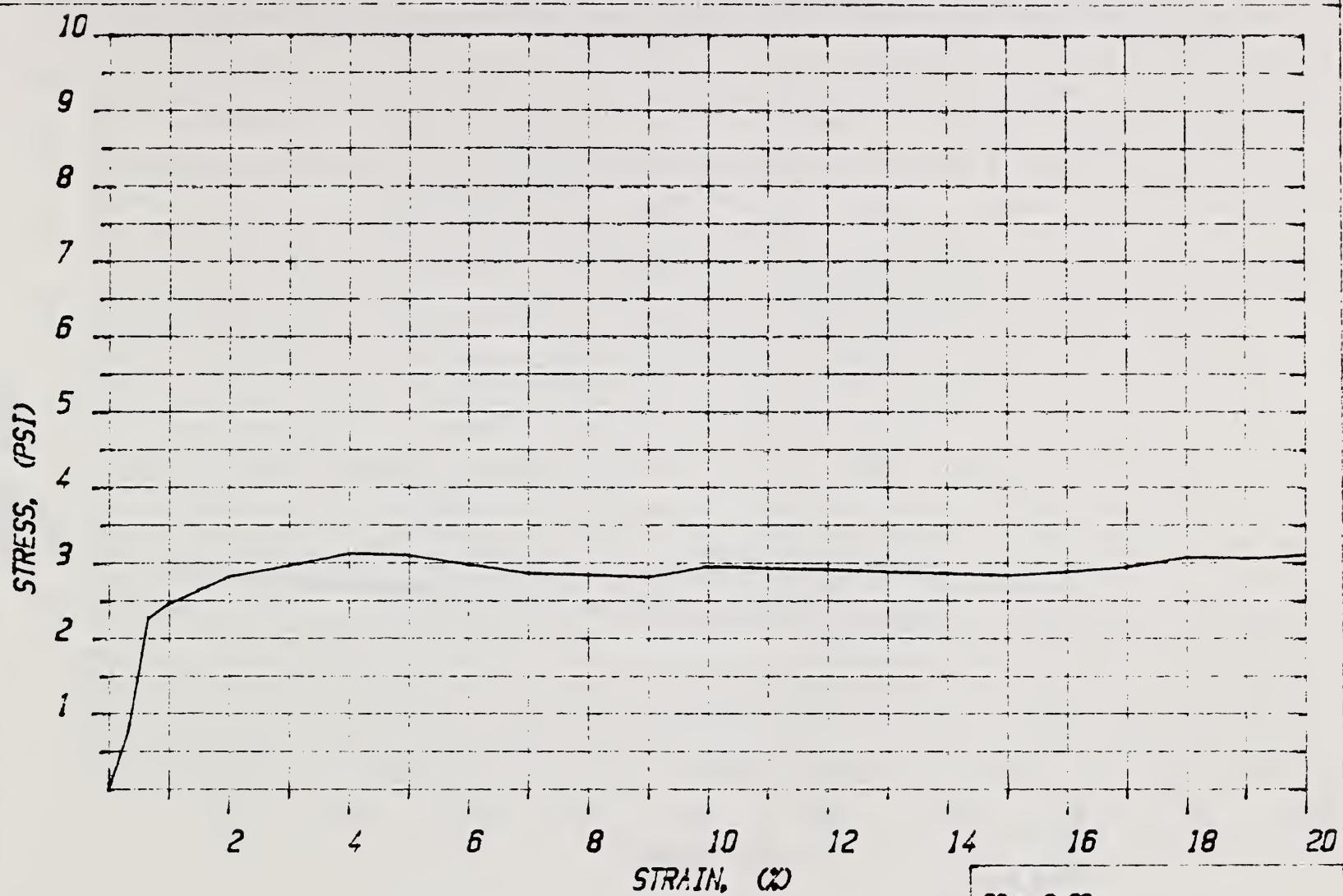
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UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C100

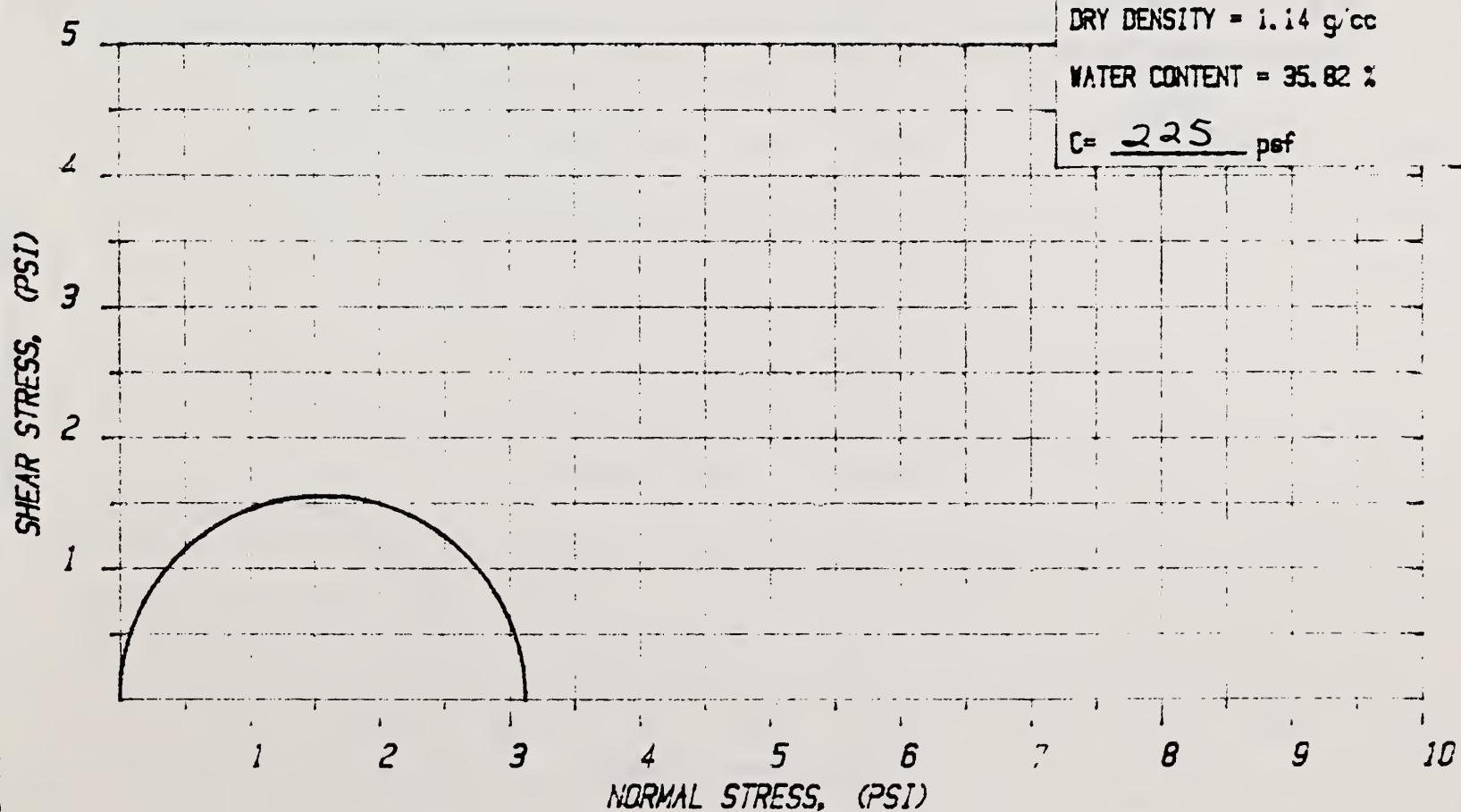
PROJECT: WEPP - SHARPSBURG SOIL - LINCOLN NE.



GS = 2.63

DRY DENSITY = 1.14 g/cc

WATER CONTENT = 35.82 %

C = 225 pcf

(C)

(C)

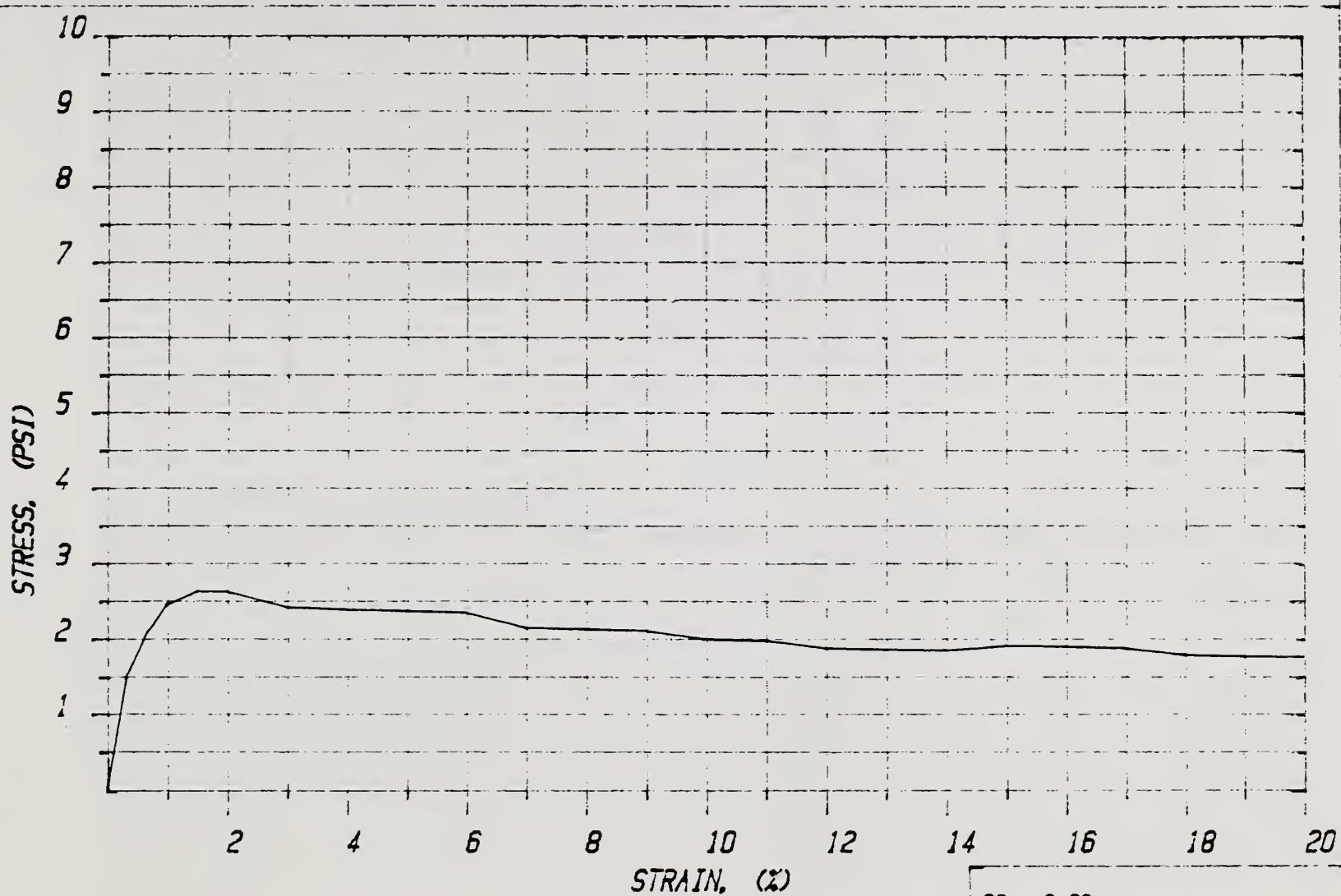
(C)

UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C101

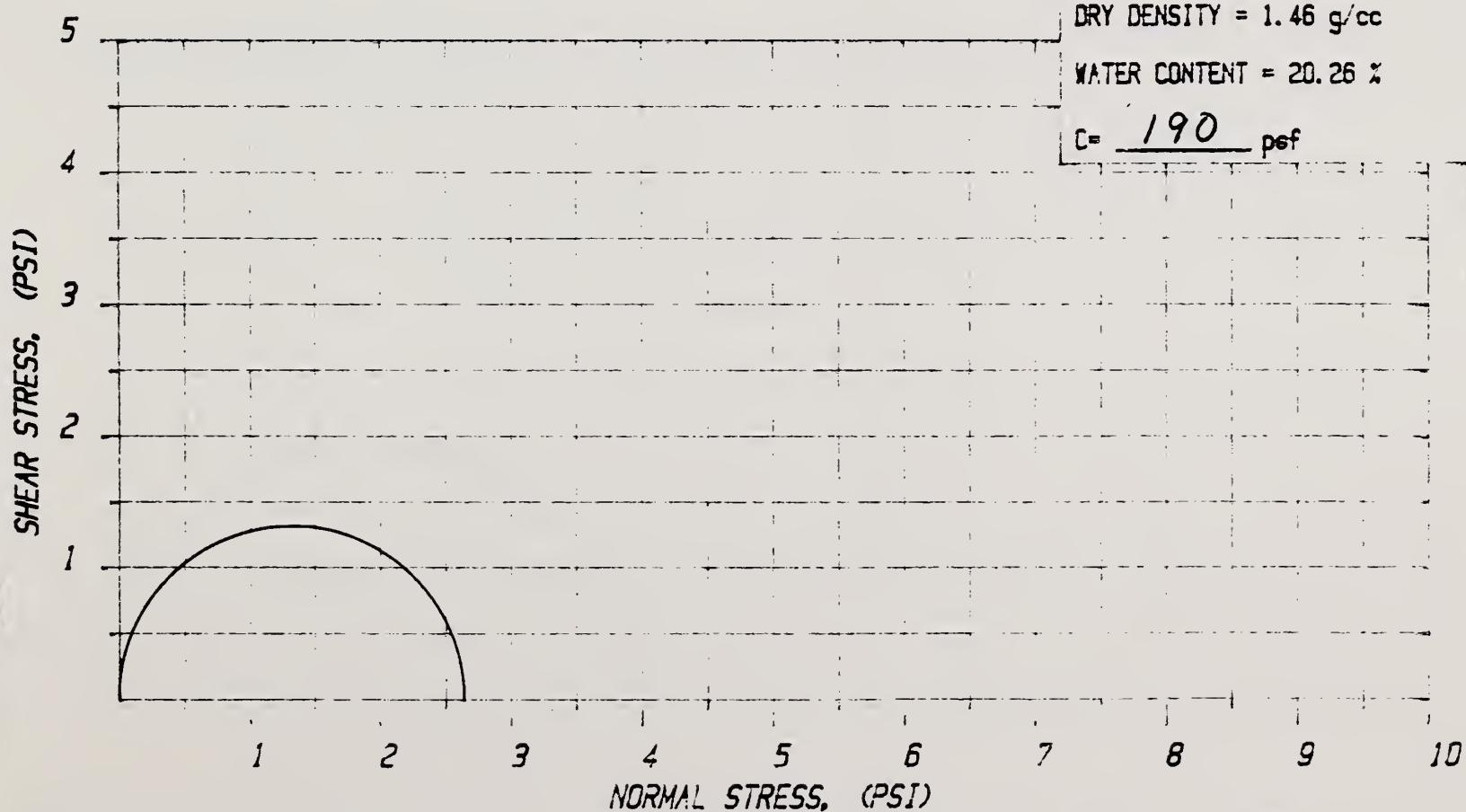
PROJECT: WEPP - SVERDRUP SOIL - MORRIS MN.



CS = 2.63

DRY DENSITY = 1.46 g/cc

WATER CONTENT = 20.26 %

c = 190 pcf

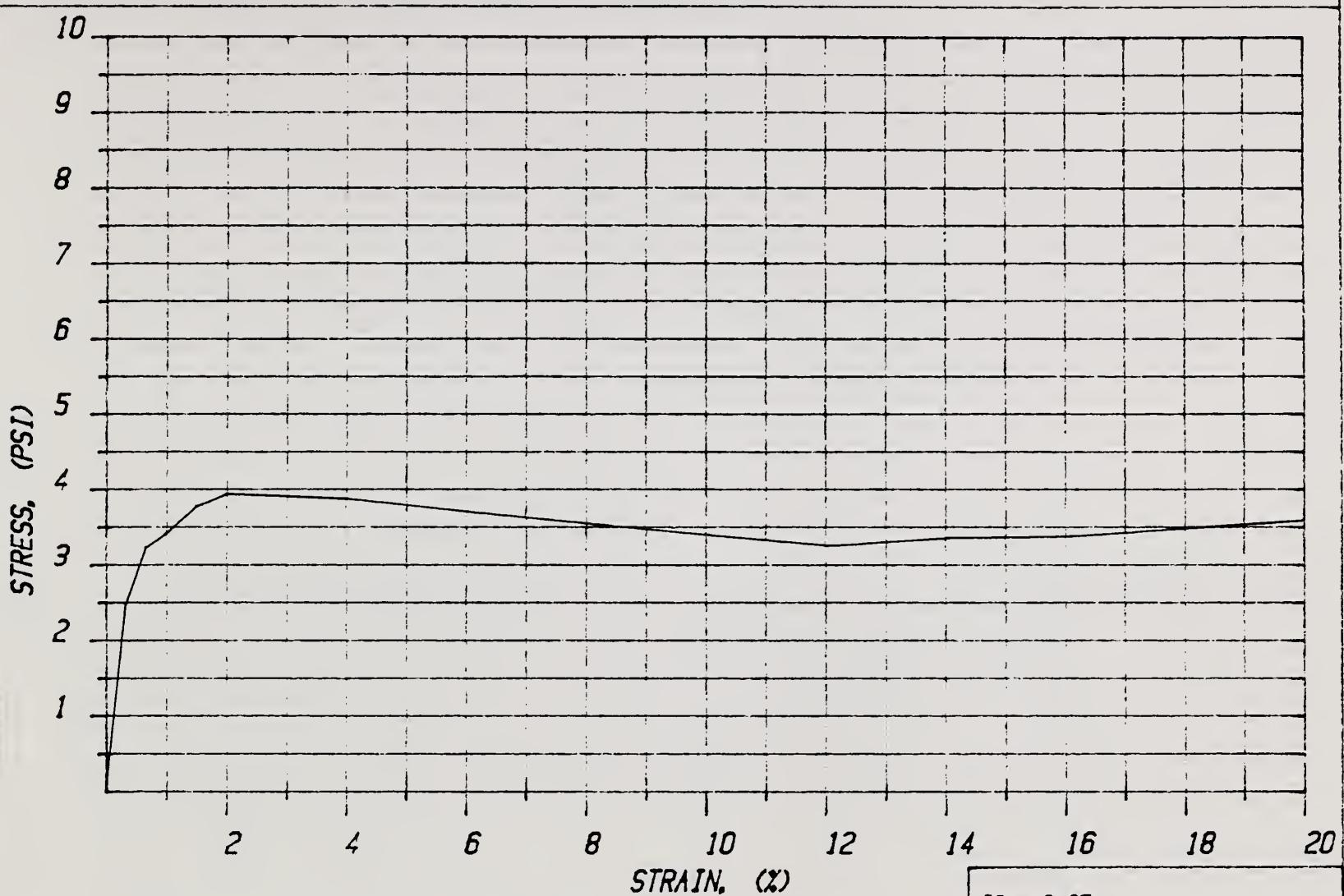


UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 102

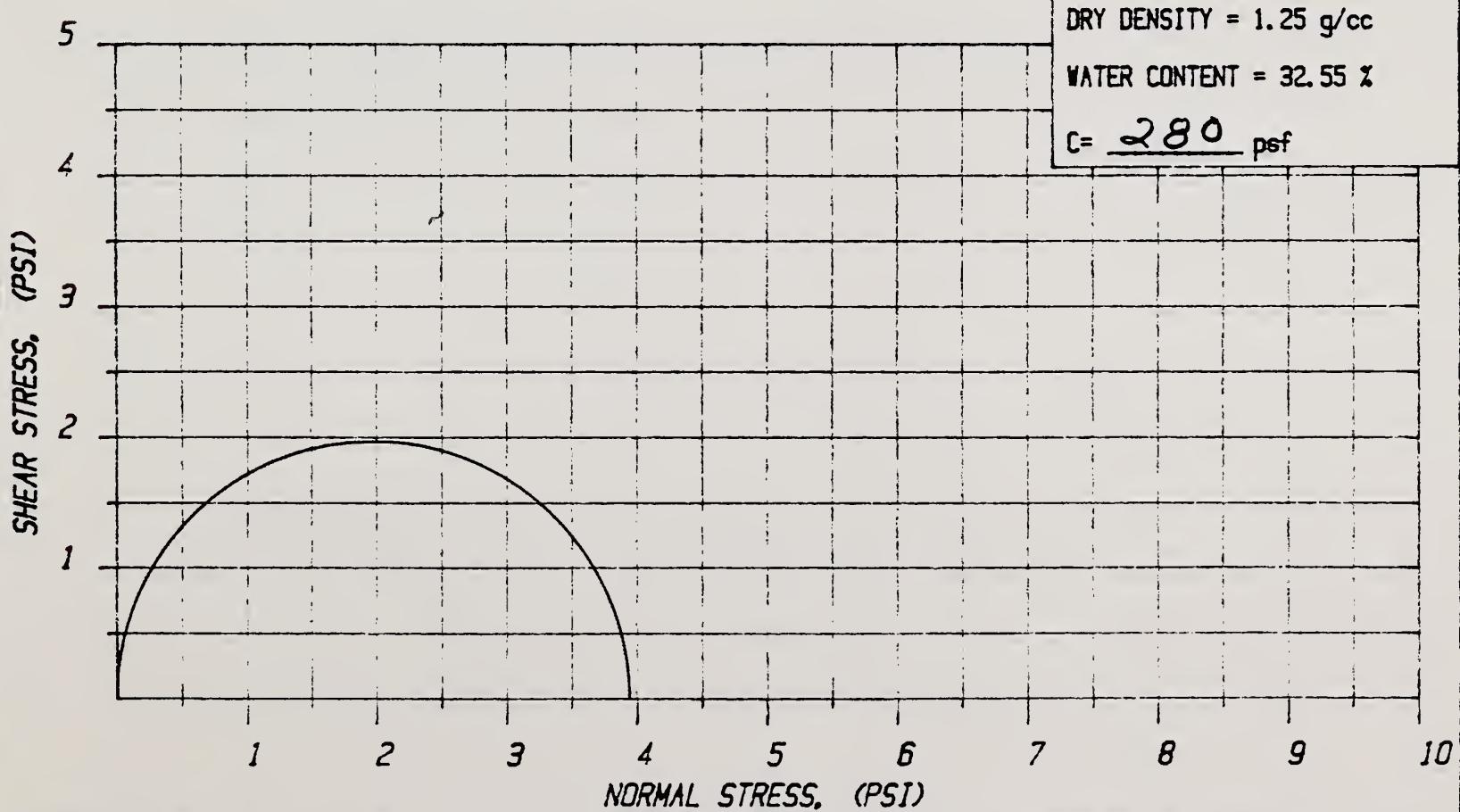
PROJECT: WEPP - WALLA WALLA SOIL - PULLMAN WA.



GS = 2.65

DRY DENSITY = 1.25 g/cc

WATER CONTENT = 32.55 %

C = 280 psf

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(

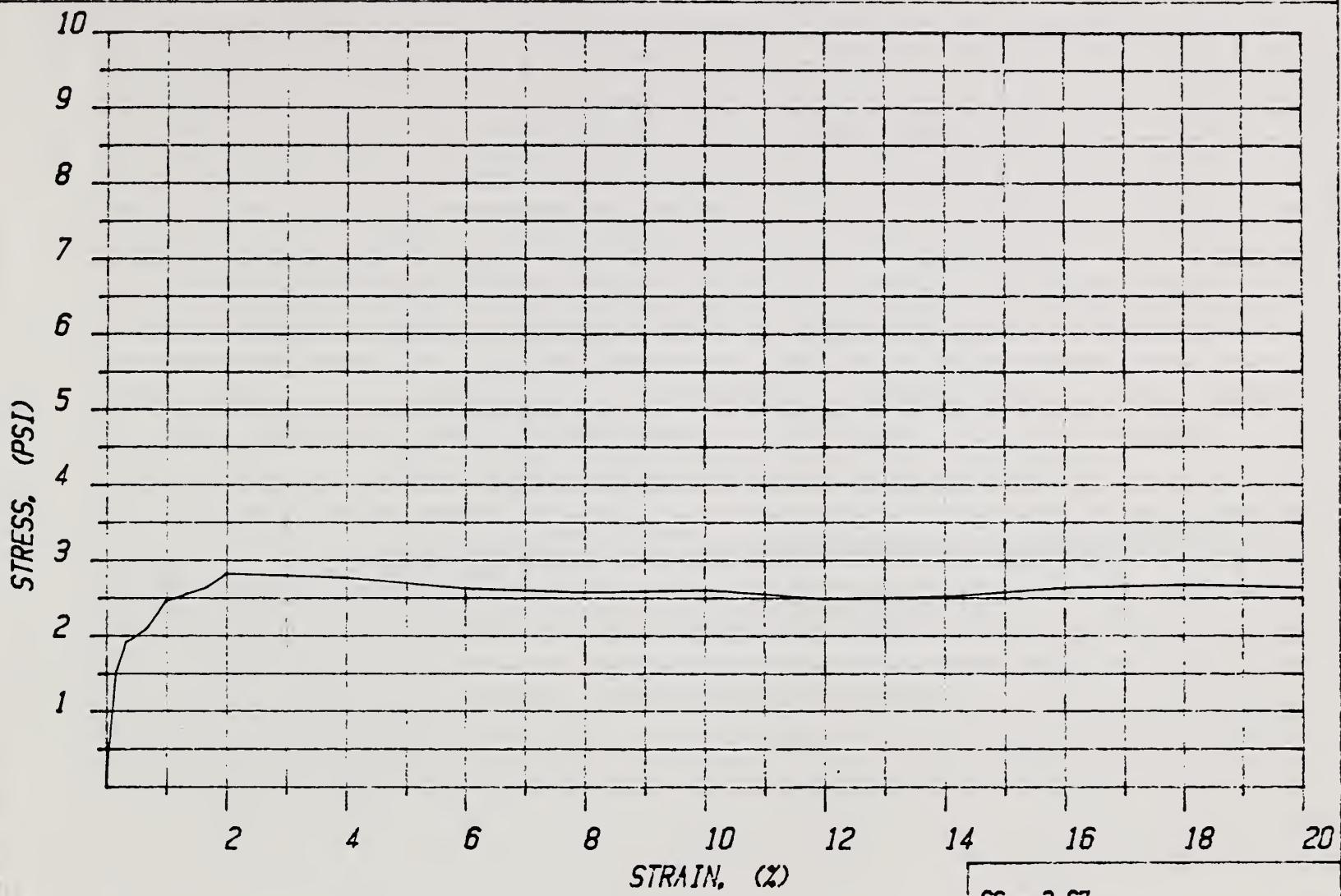
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UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 103

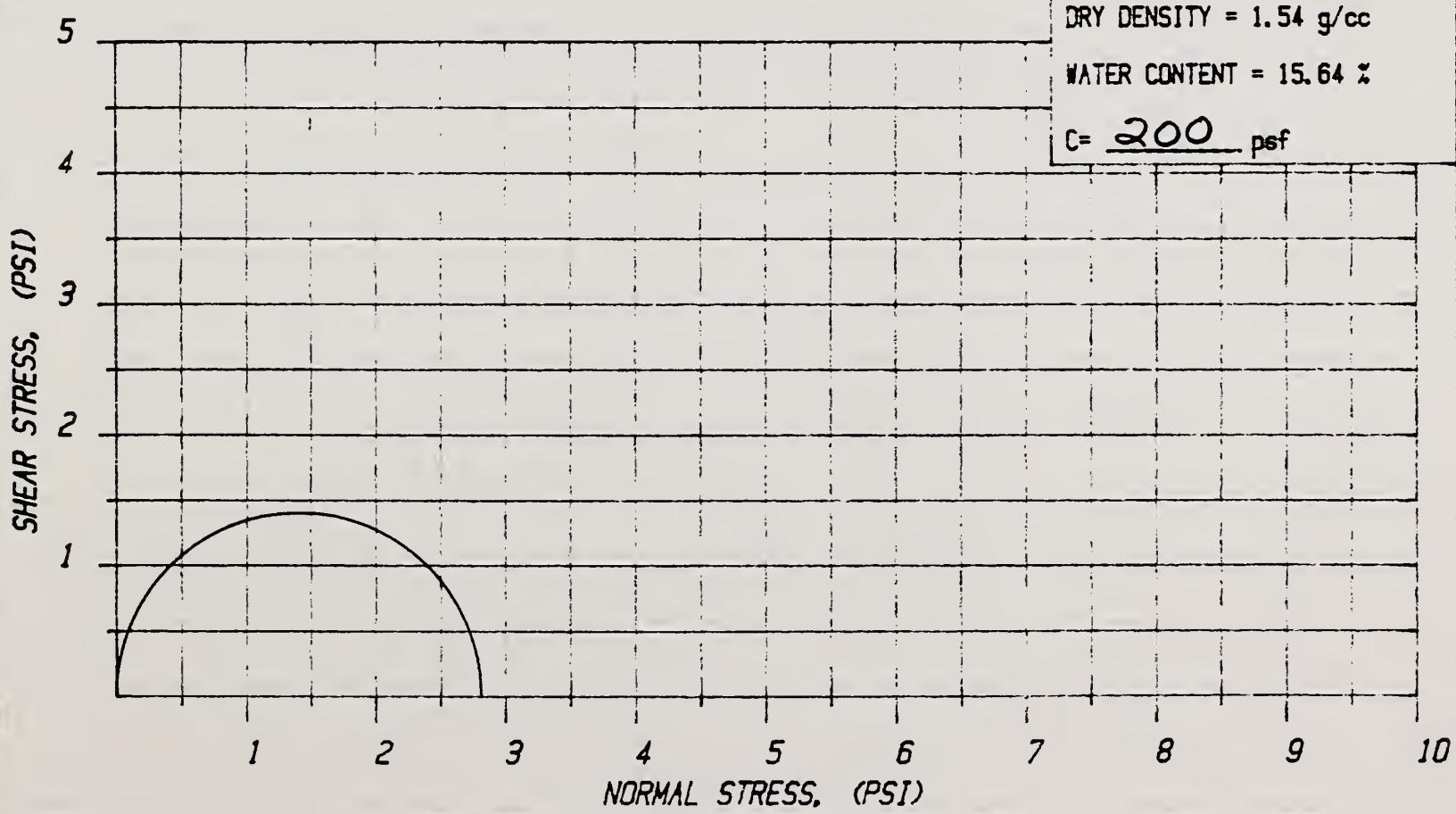
PROJECT: WEPP - WHITNEY SOIL - FRESNO CA.

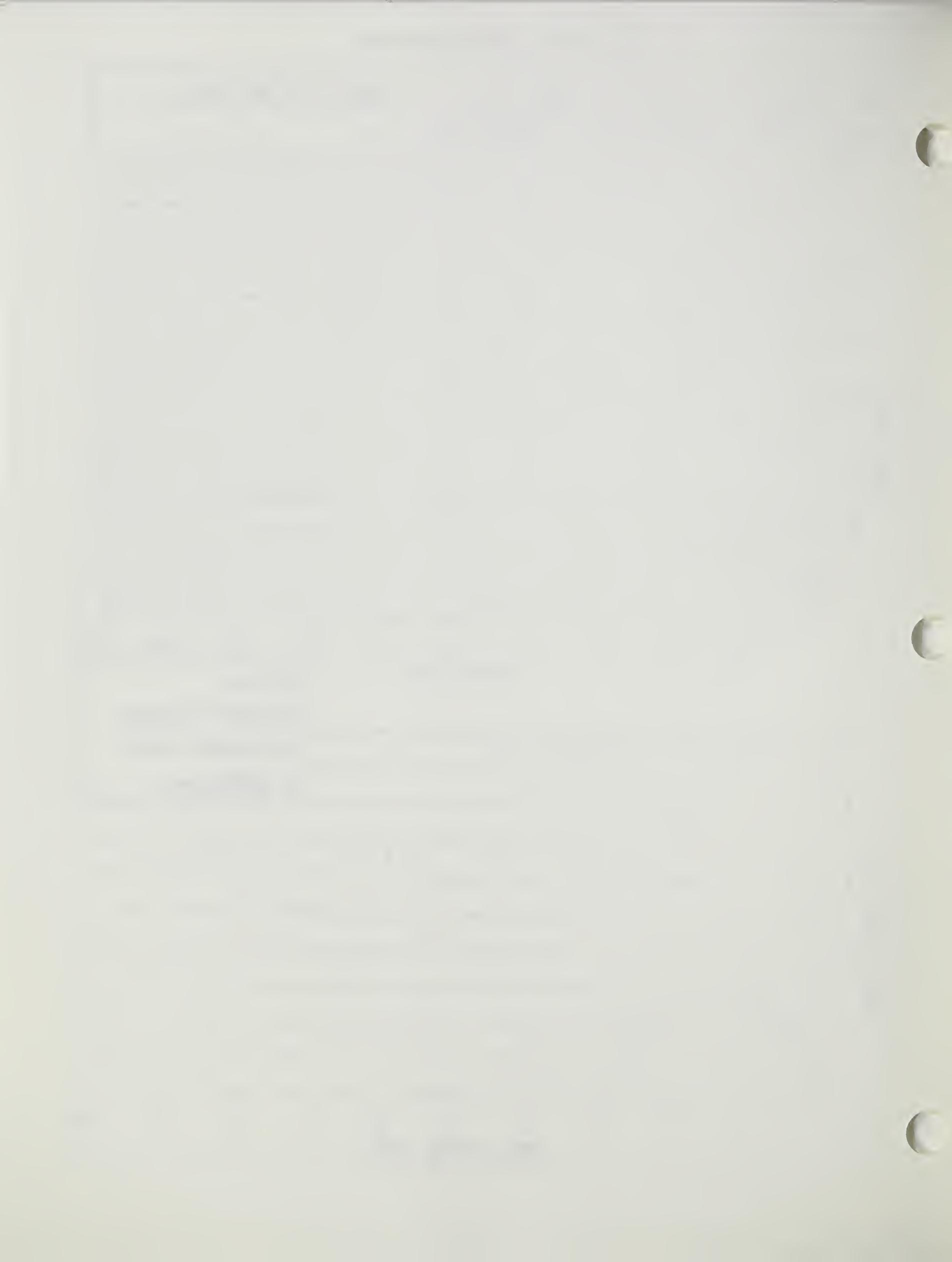


GS = 2.67

DRY DENSITY = 1.54 g/cc

WATER CONTENT = 15.64 %

C = 200 psf

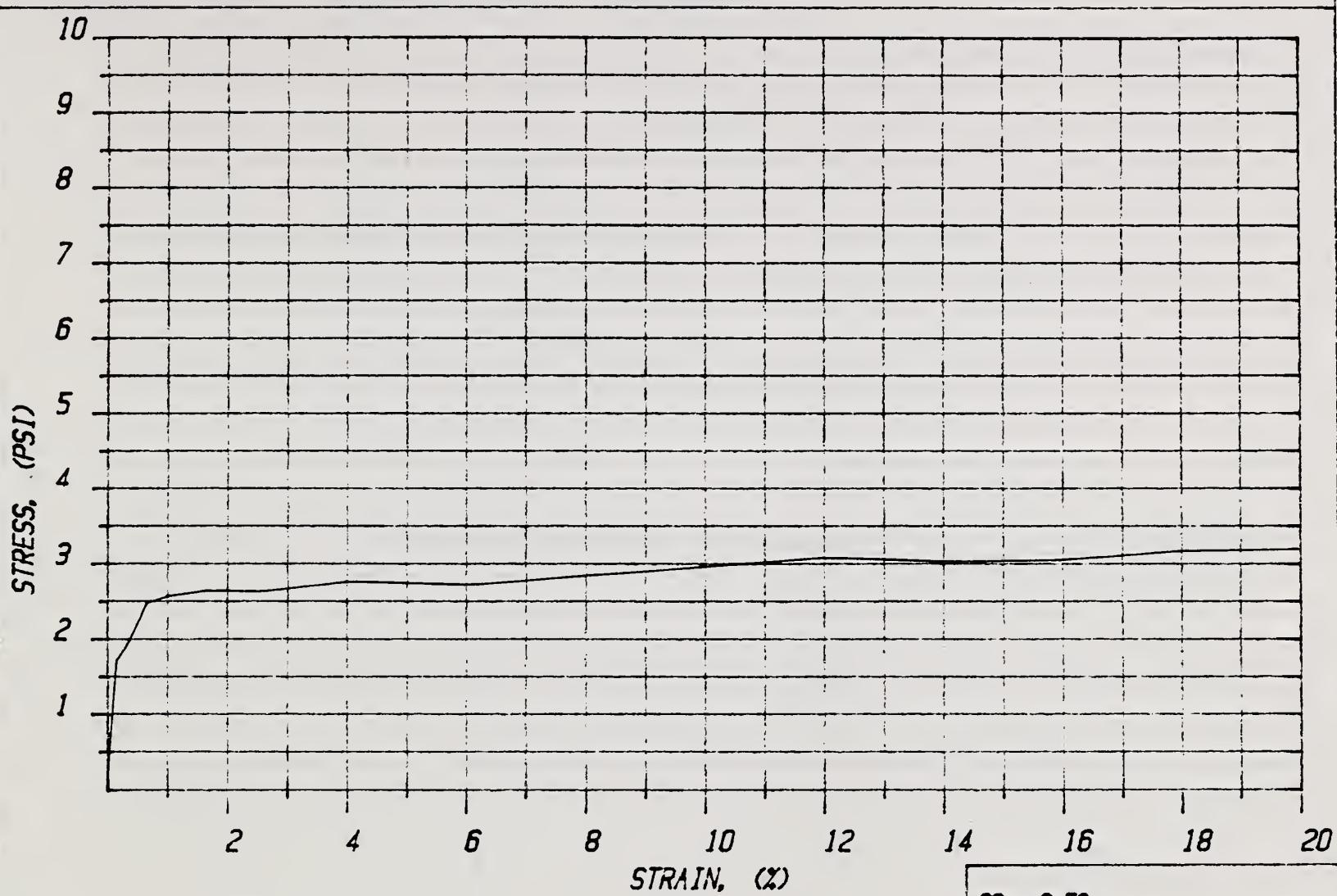


UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 104

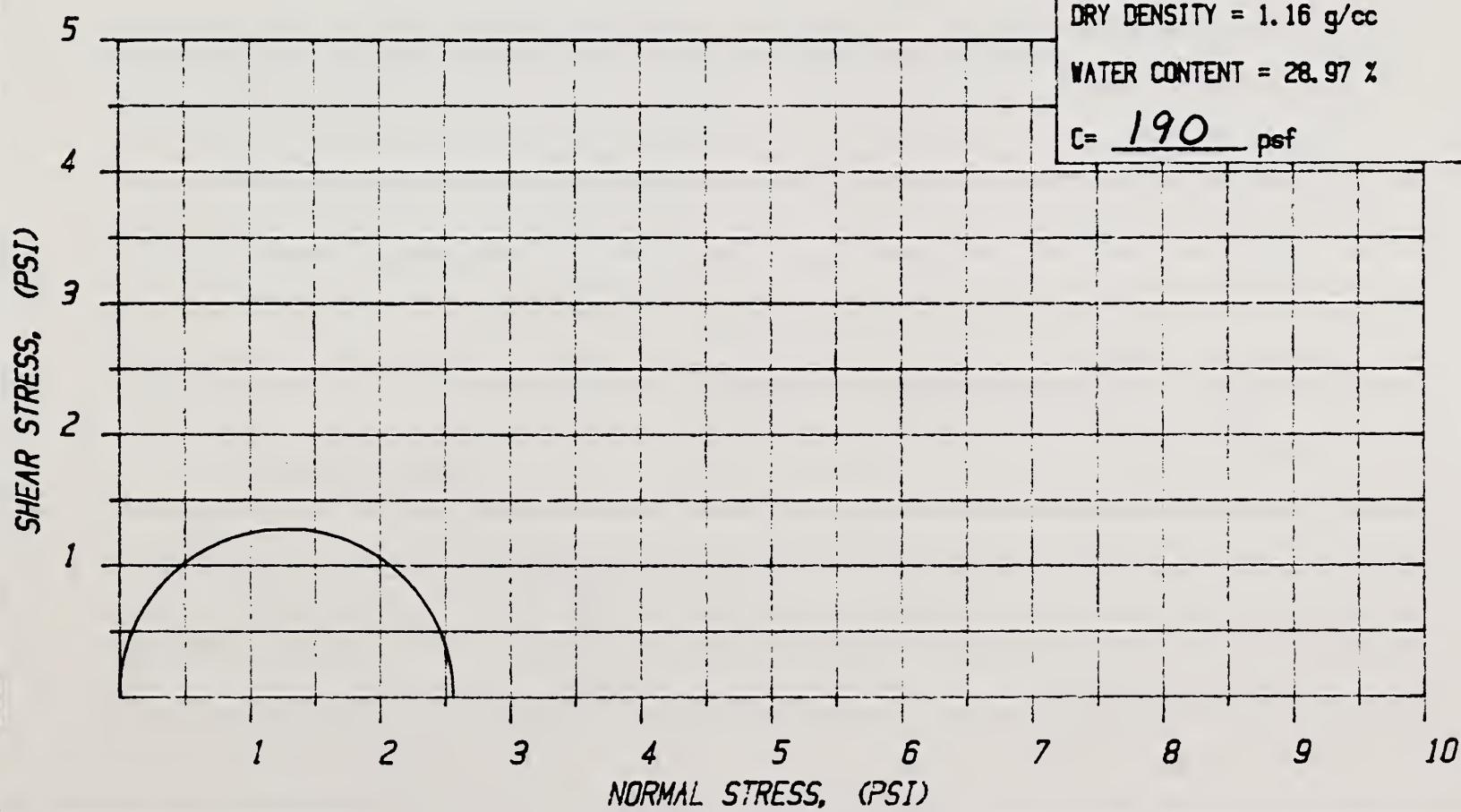
PROJECT: WEPP - WILLIAMS SOIL - McCLUSKY ND.



GS = 2.59

DRY DENSITY = 1.16 g/cc

WATER CONTENT = 28.97 %

c = 190 psf

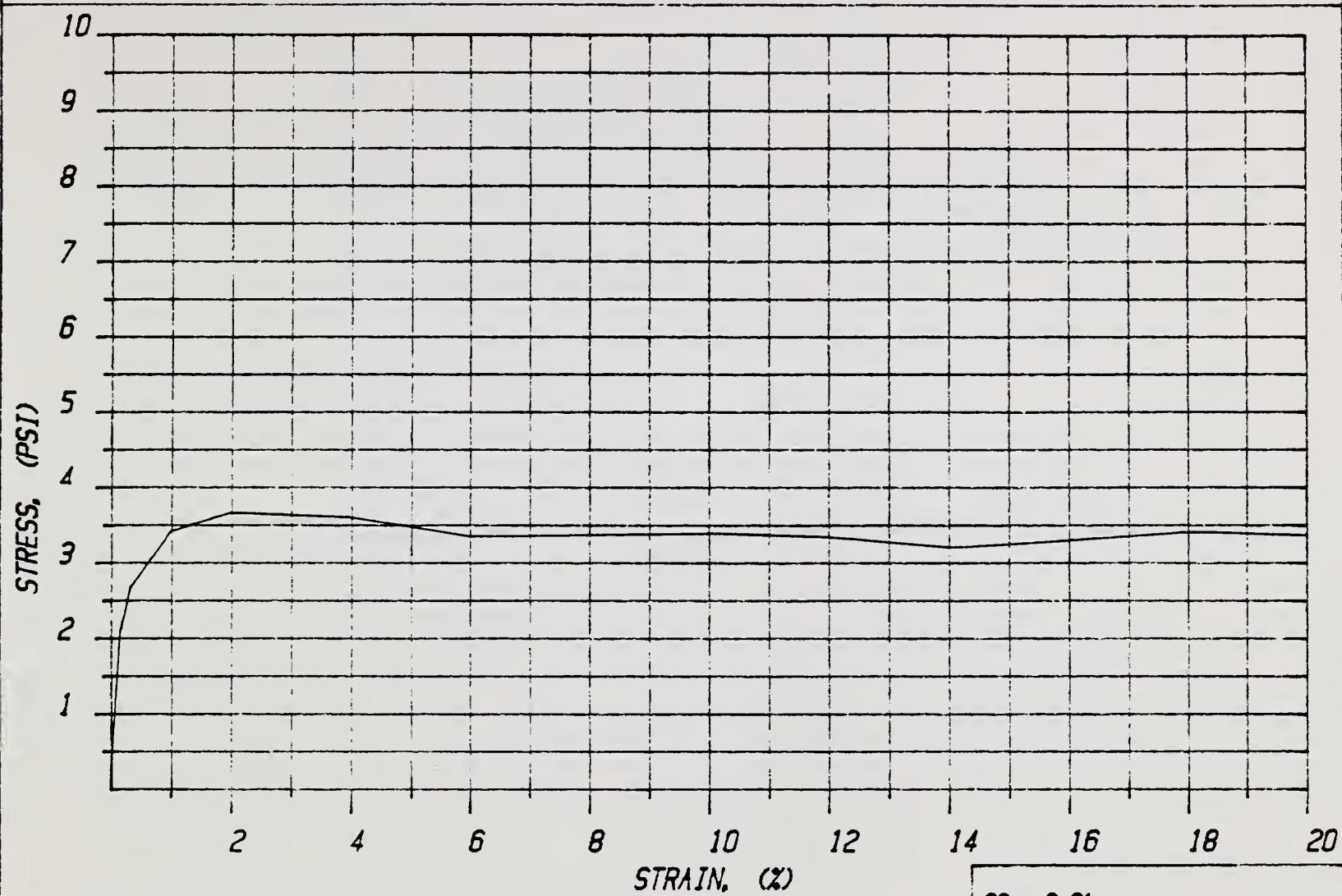


UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 105

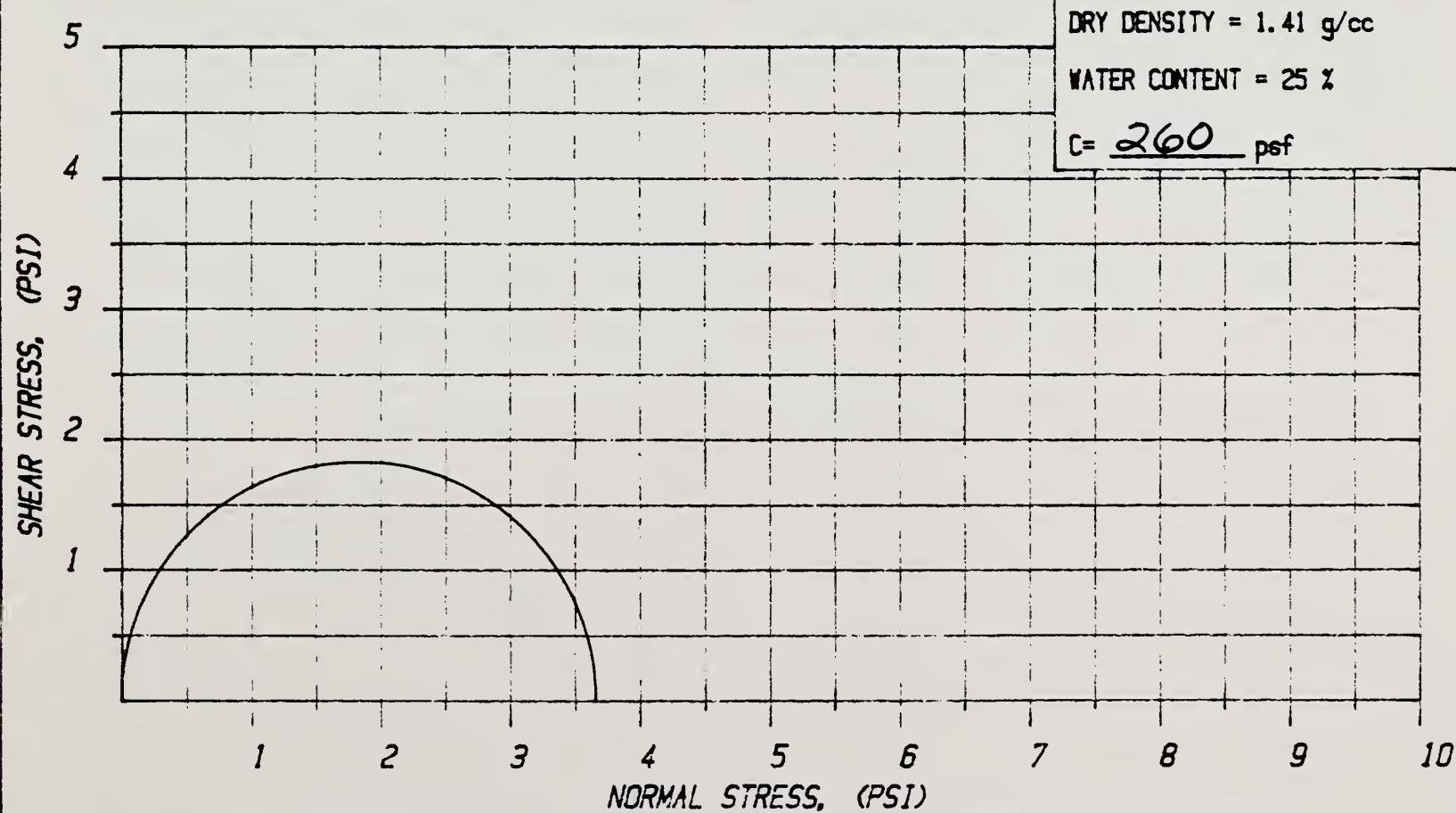
PROJECT: WEPP - WOODWARD SOIL - OKLAHOMA



GS = 2.61

DRY DENSITY = 1.41 g/cc

WATER CONTENT = 25 %

C = 260 psf

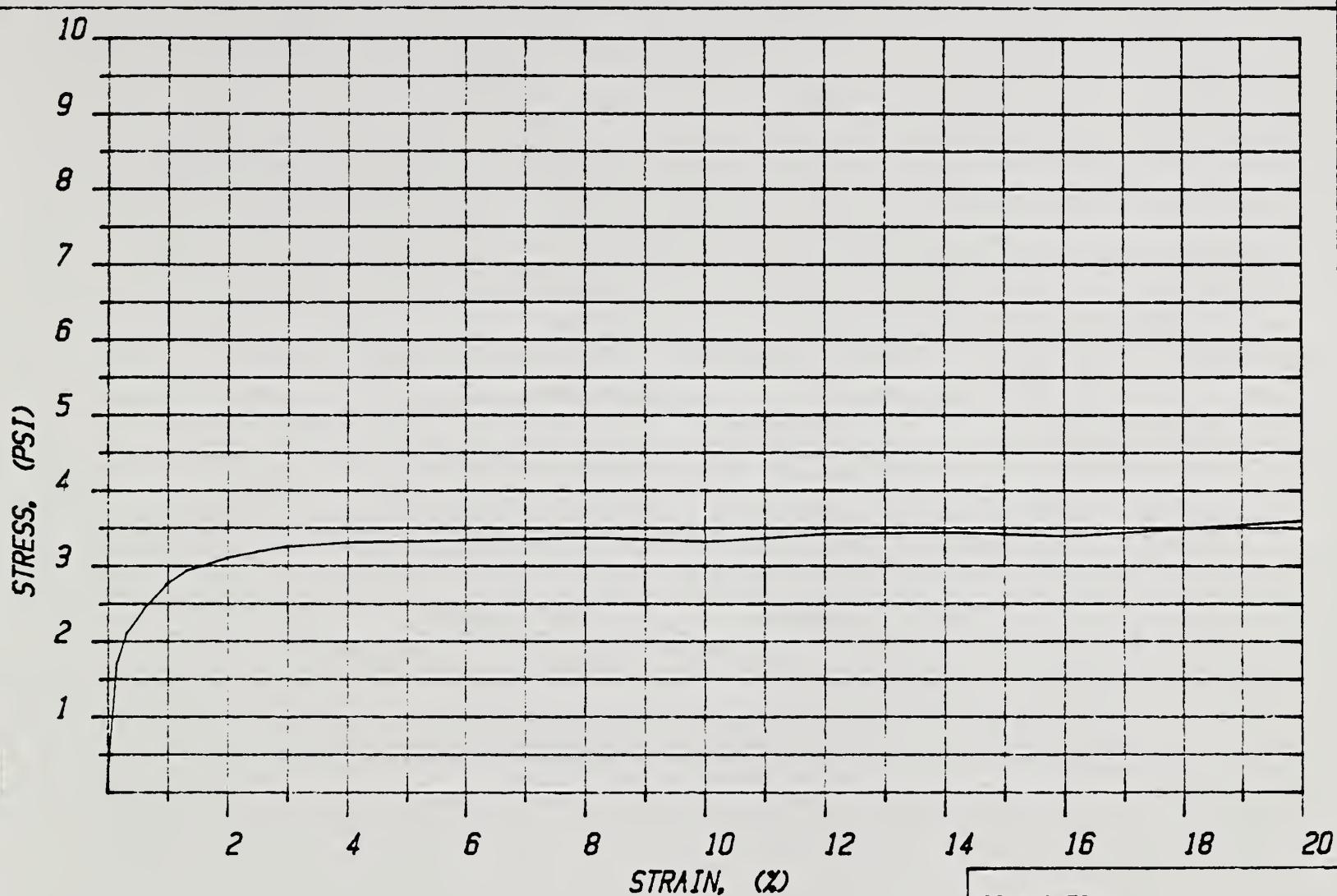


UNCONFINED COMPRESSION TEST

SOIL MECHANICS LABORATORY, LINCOLN NE.

SAMPLE NO. 88C 106

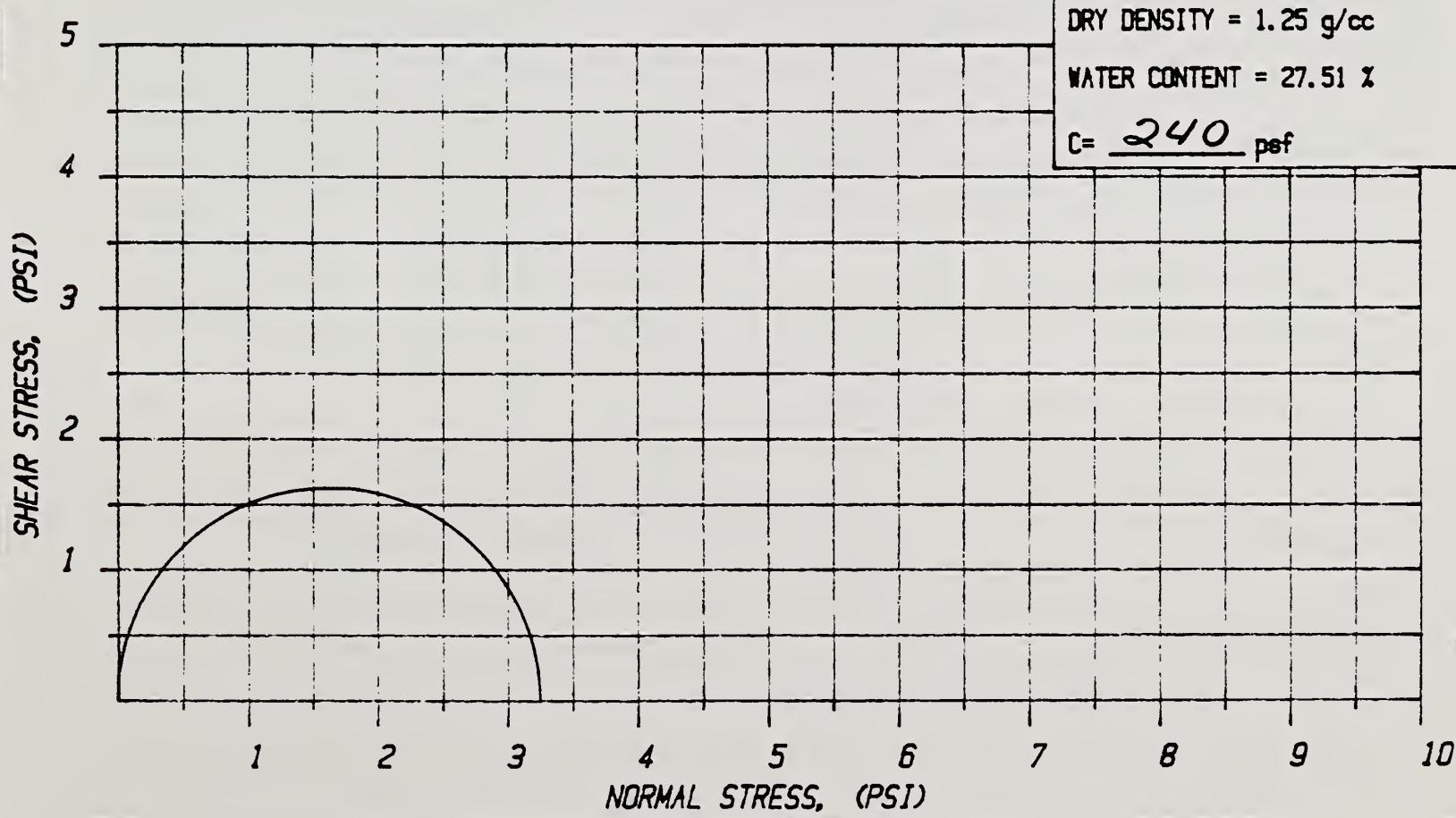
PROJECT: WEPP - ZAHL SOIL - NORTH DAKOTA

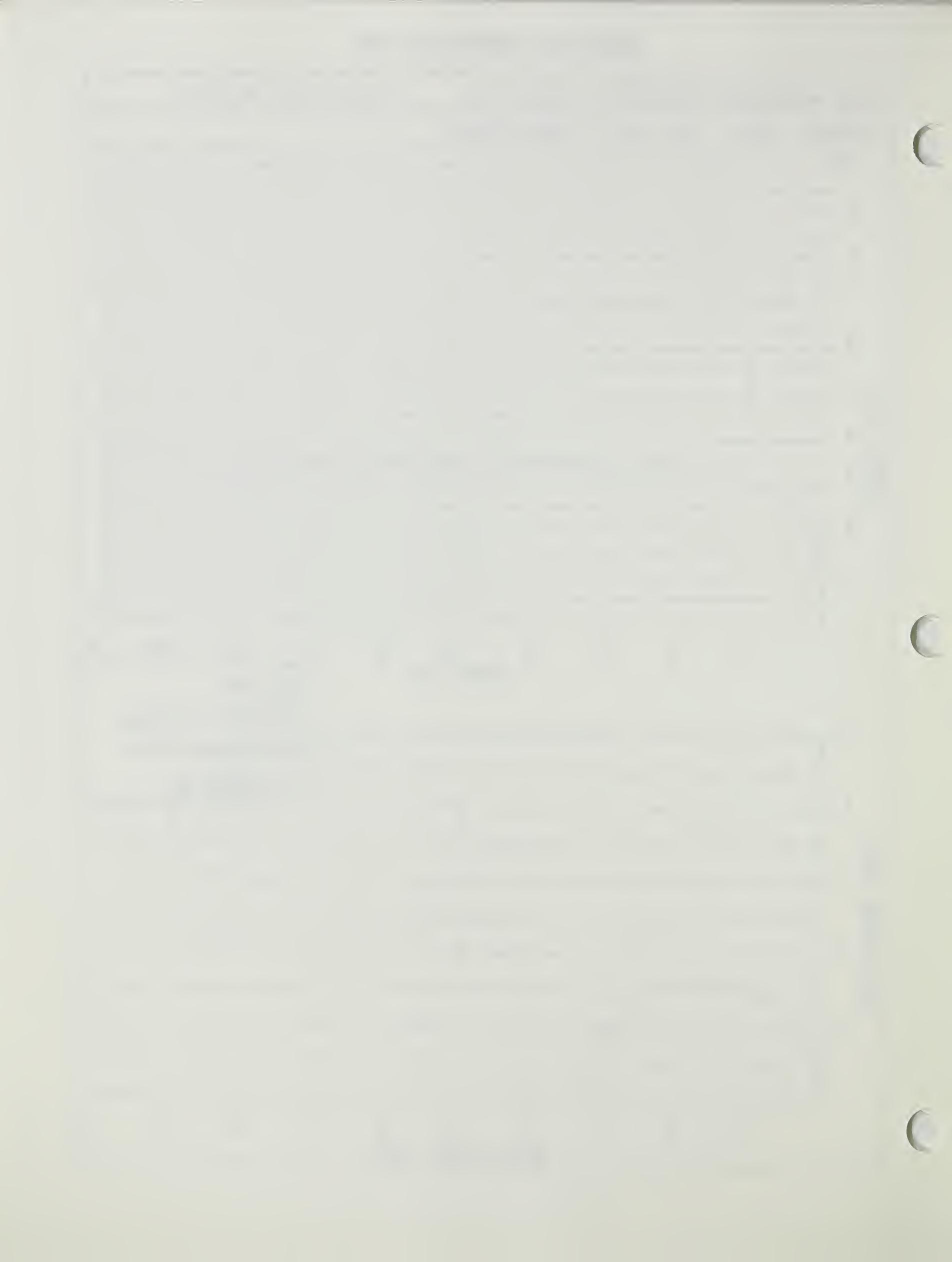


GS = 2.58

DRY DENSITY = 1.25 g/cc

WATER CONTENT = 27.51 %

C = 240 psf



Consolidation Test Data



RESULTS OF CONSOLIDATION TEST

WEPP-Sample

Project: ABILENE-TEXAS

Field number:

LAB.NUMBER 88C89

Sample depth: Feet

Sample description: REMOLDED TO 1.50 GMS/CC NON-PLASTIC SM SATURATED AT START OF TEST

SAMPLE DIAMETER: 2.5 ins

SAMPLE HEIGHT: 1 ins

INITIAL VOLUME: 80.439 cm³

INITIAL WET WEIGHT: 129.27 g

INITIAL DRY WEIGHT: 120.66 g

INITIAL WATER CONTENT: 7.1 %

INITIAL WET DENSITY: 100.327 PCF

INITIAL DRY DENSITY: 93.645 PCF

SPECIFIC GRAVITY: 2.63

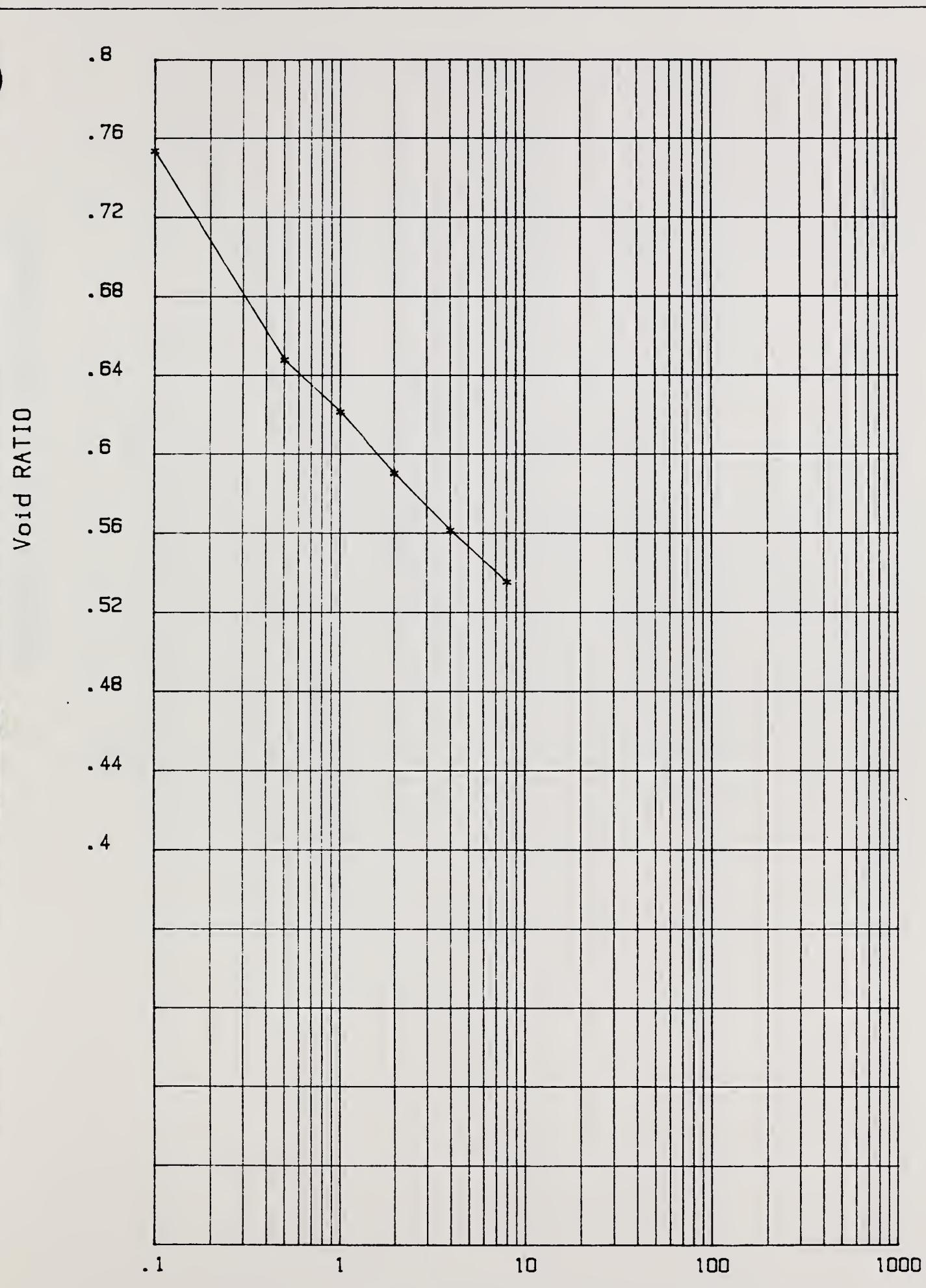
INITIAL VOID RATIO: .753

FINAL WET WEIGHT: 140.12 g

FINAL WATER CONTENT: 16.1 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	0.0000	.7530	0.00
2.0	.50	.0604	.6470	6.04
3.0	1.00	.0755	.6200	7.55
4.0	2.00	.0933	.5890	9.33
5.0	4.00	.1098	.5600	10.98
6.0	8.00	.1247	.5340	12.47





Project: ABILENE-TEXAS

Field number:

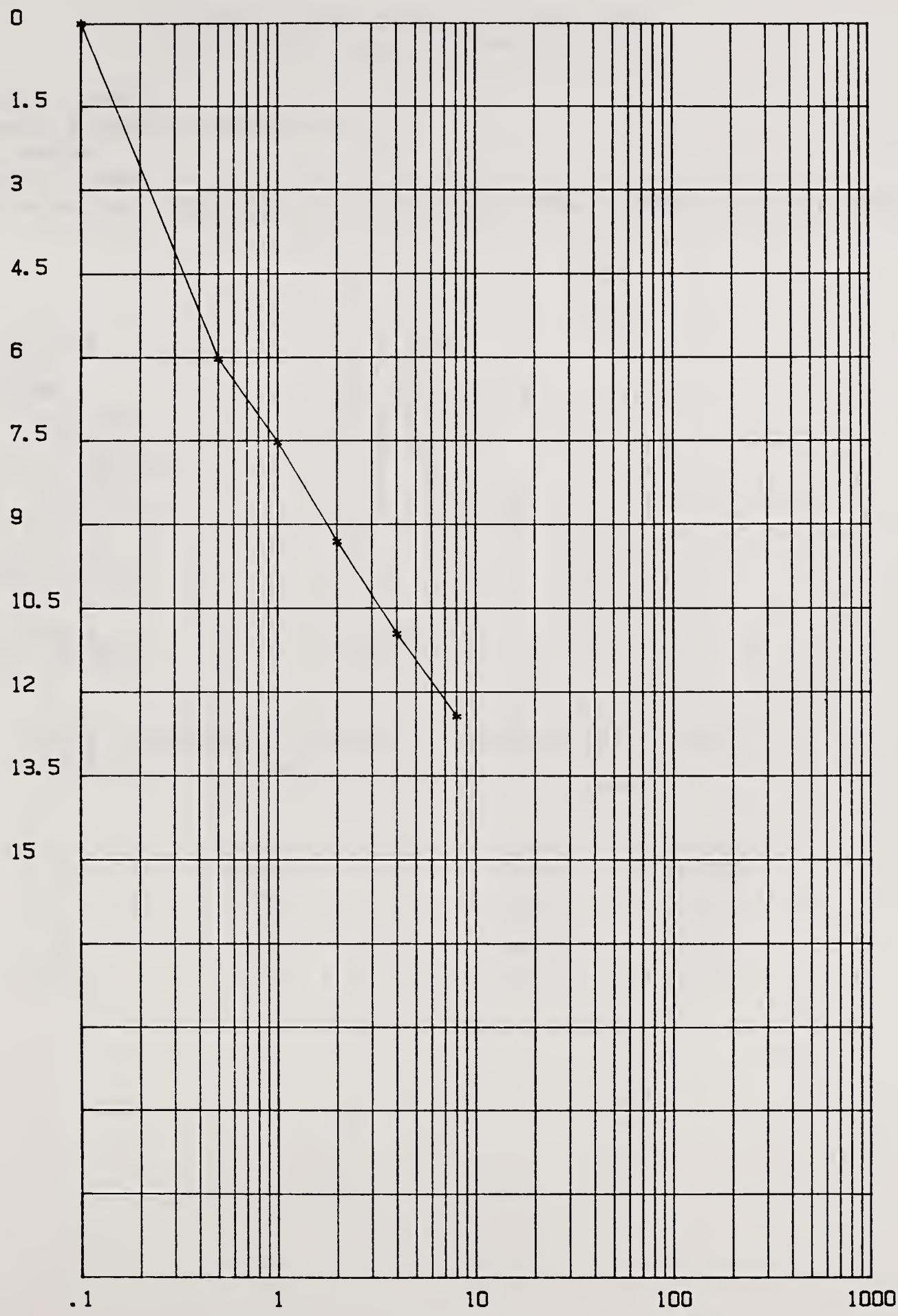
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C89

Sample depth: Feet



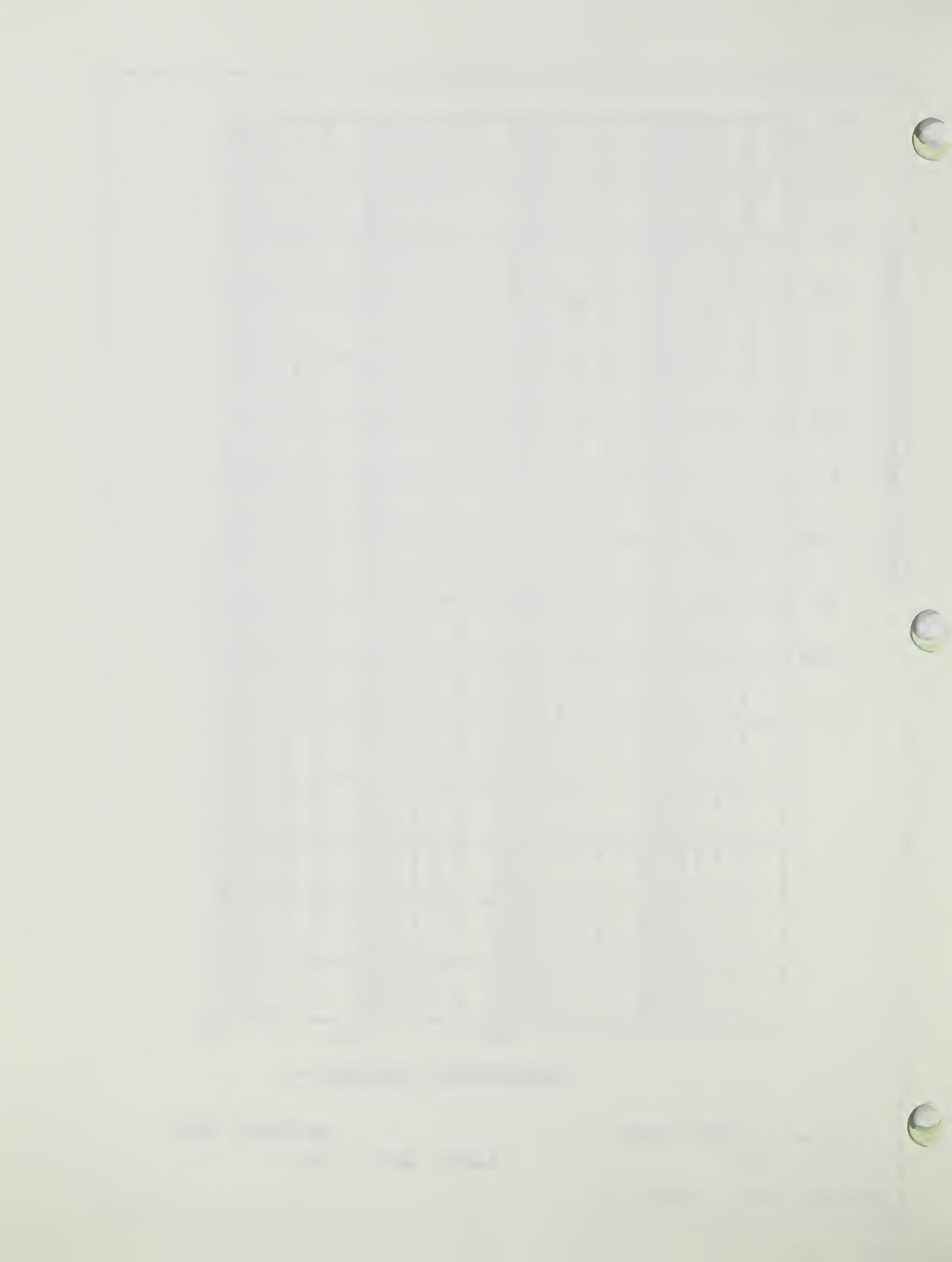
PERCENT CONSOLIDATION-LAB. SAMPLE,



Project: ABILENE-TEXAS
Field number:
USDA-SCS S. M. L. LINCOLN NE.

CONSOLIDATION PRESSURE, ksf
Sample depth: Feet

LAB. NUMBER 88C89



RESULTS OF CONSOLIDATION TEST

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Project: WEPP SAMPLE

Field number: ACADEMY-FRESNO CA.

LAB. NUMBER 88C90

Sample depth: Feet

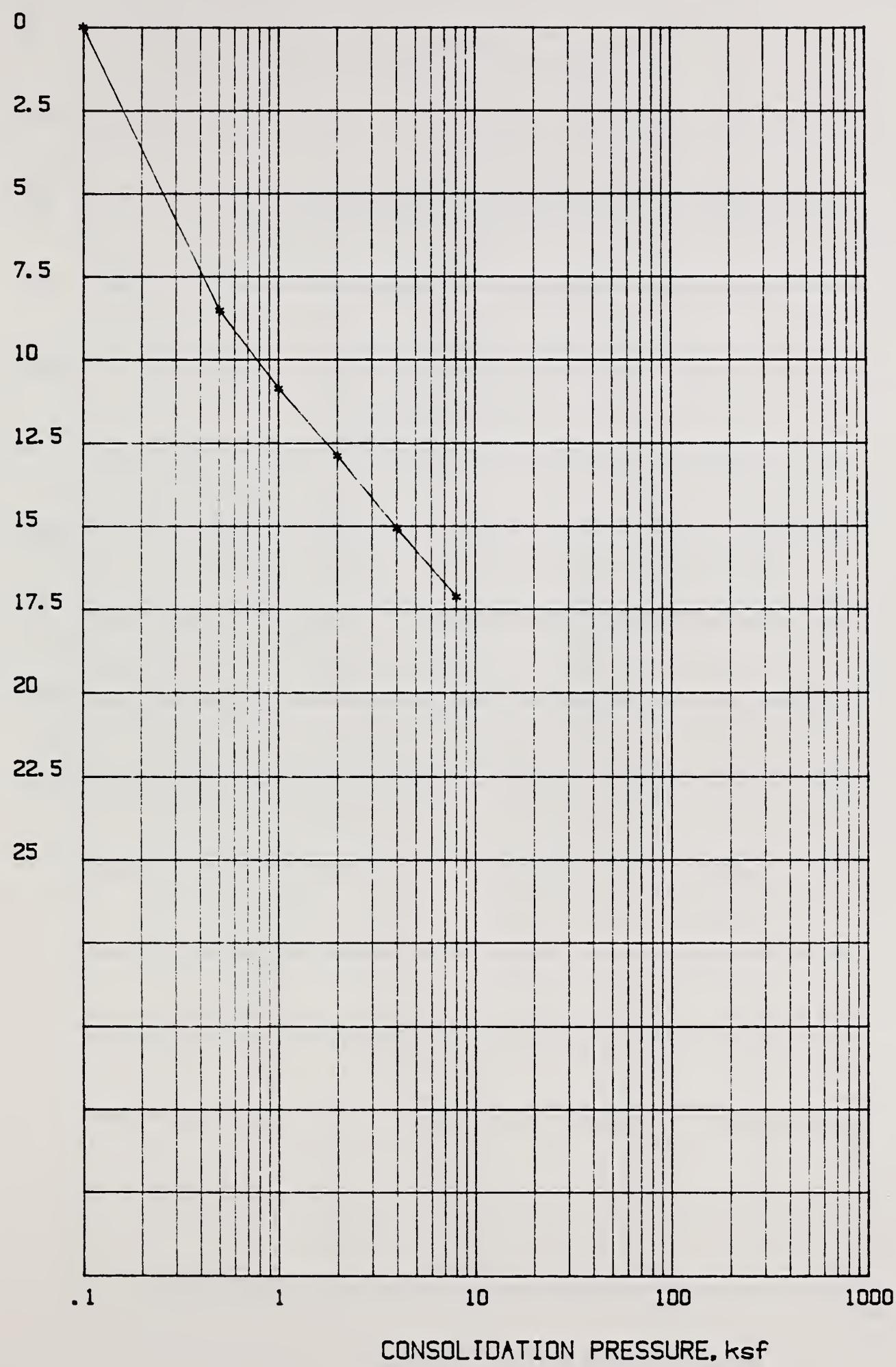
Sample description: REMOLDED TO 1.61 GM/CC NON-PLASTIC SM SATURATED AT START OF TEST

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	133.44 g
INITIAL DRY WEIGHT:	128.88 g
INITIAL WATER CONTENT:	3.5 %
INITIAL WET DENSITY:	103.563 PCF
INITIAL DRY DENSITY:	100.024 PCF
SPECIFIC GRAVITY:	2.75
INITIAL VOID RATIO:	.716
FINAL WET WEIGHT:	146.86 g
FINAL WATER CONTENT:	13.9 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	0.0000	.7160	0.00
2.0	.50	.0855	.5690	8.55
3.0	1.00	.1090	.5290	10.90
4.0	2.00	.1292	.4940	12.92
5.0	4.00	.1511	.4570	15.11
6.0	8.00	.1717	.4210	17.17



PERCENT CONSOLIDATION-LAB. SAMPLE.



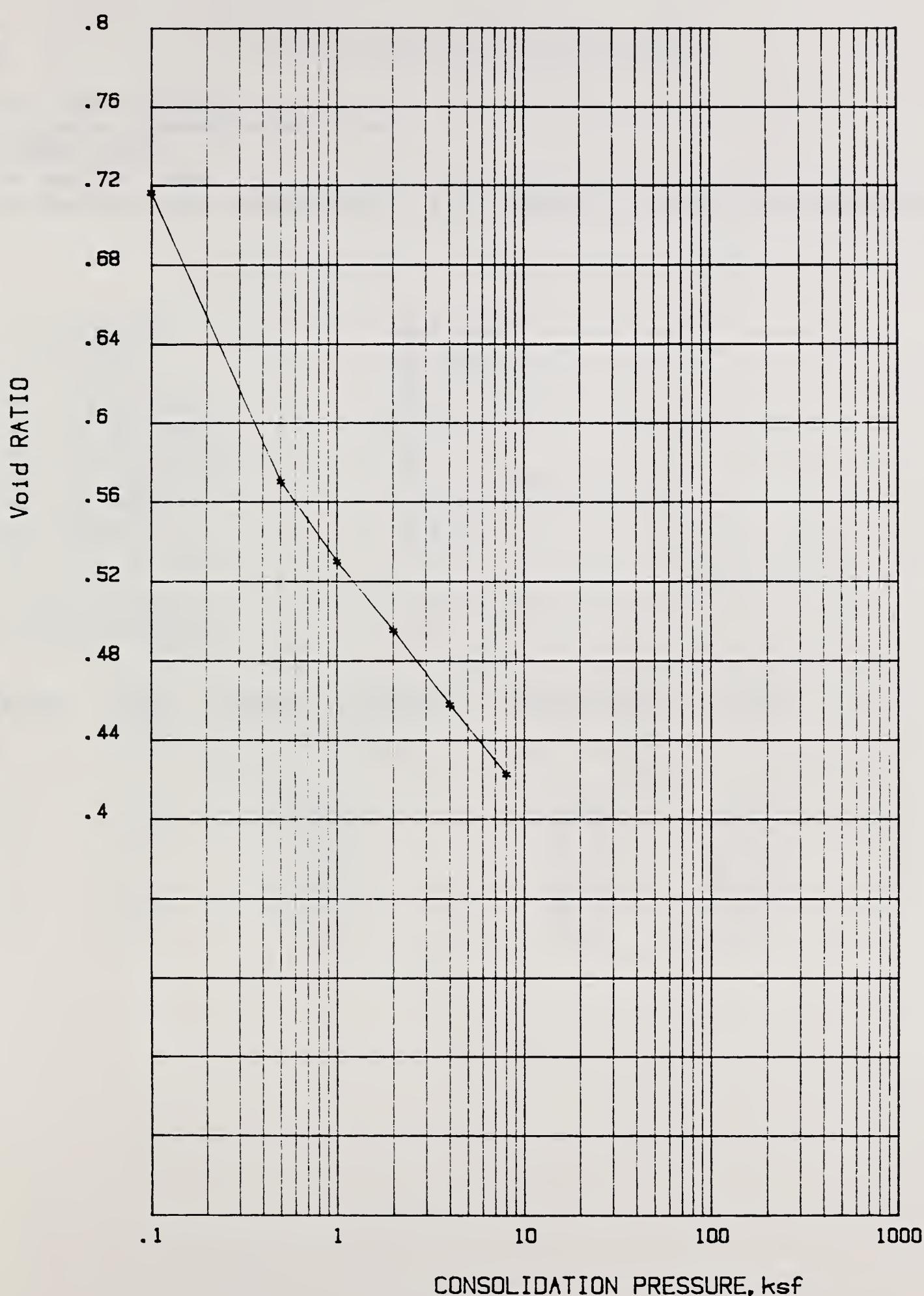
Project: WEPP SAMPLE

LAB. NUMBER 88C90

Field number: ACADEMY-FRESNO CA. Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.





Project: WEPP SAMPLE

LAB. NUMBER 88C90

Field number: ACADEMY-FRESNO CA. Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



RESULTS OF CONSOLIDATION TEST

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Project: WEPP SAMPLE

Field number: BARNES-MORRIS MN.

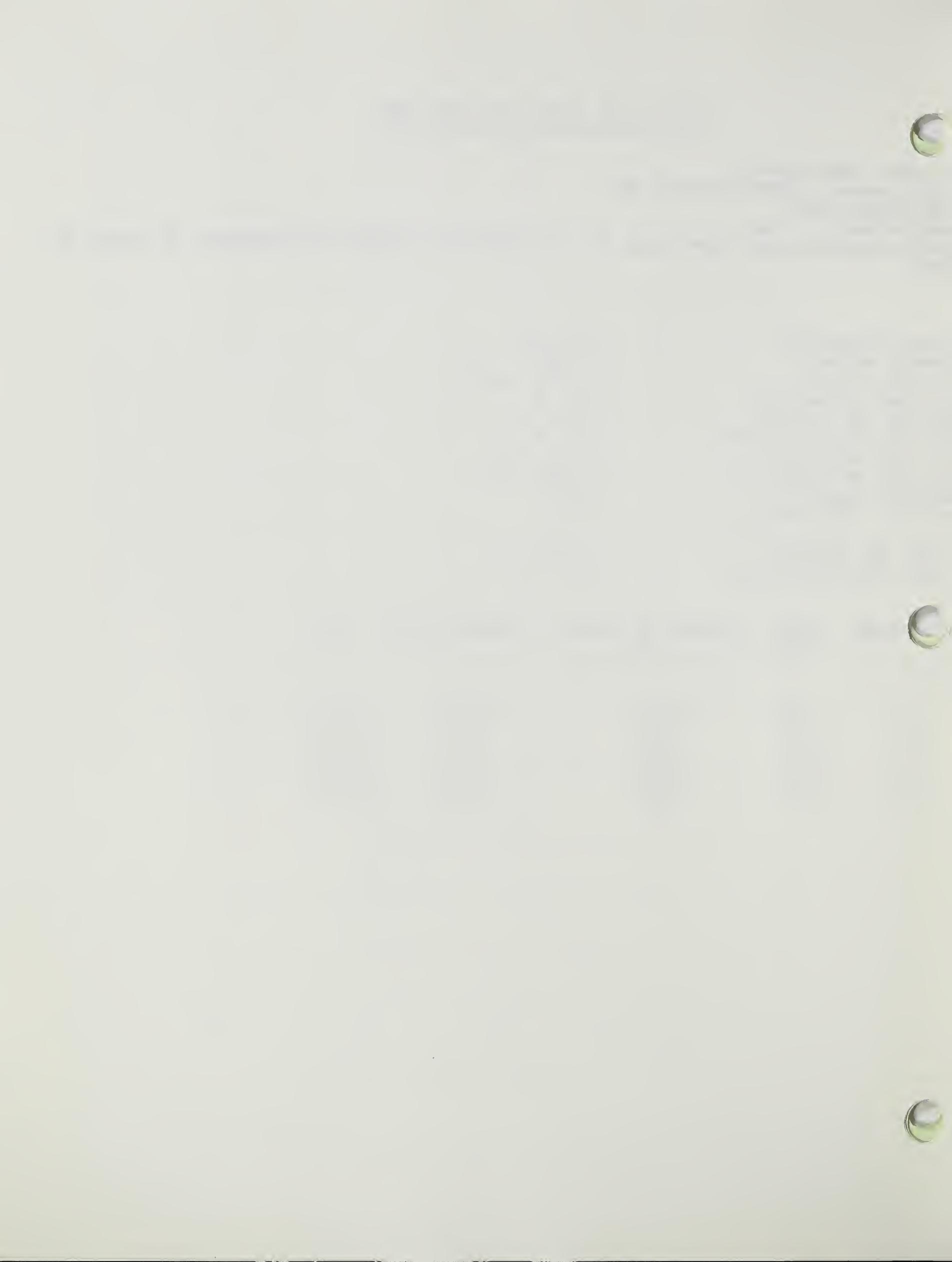
LAB. NUMBER 88C91

Sample depth: Feet

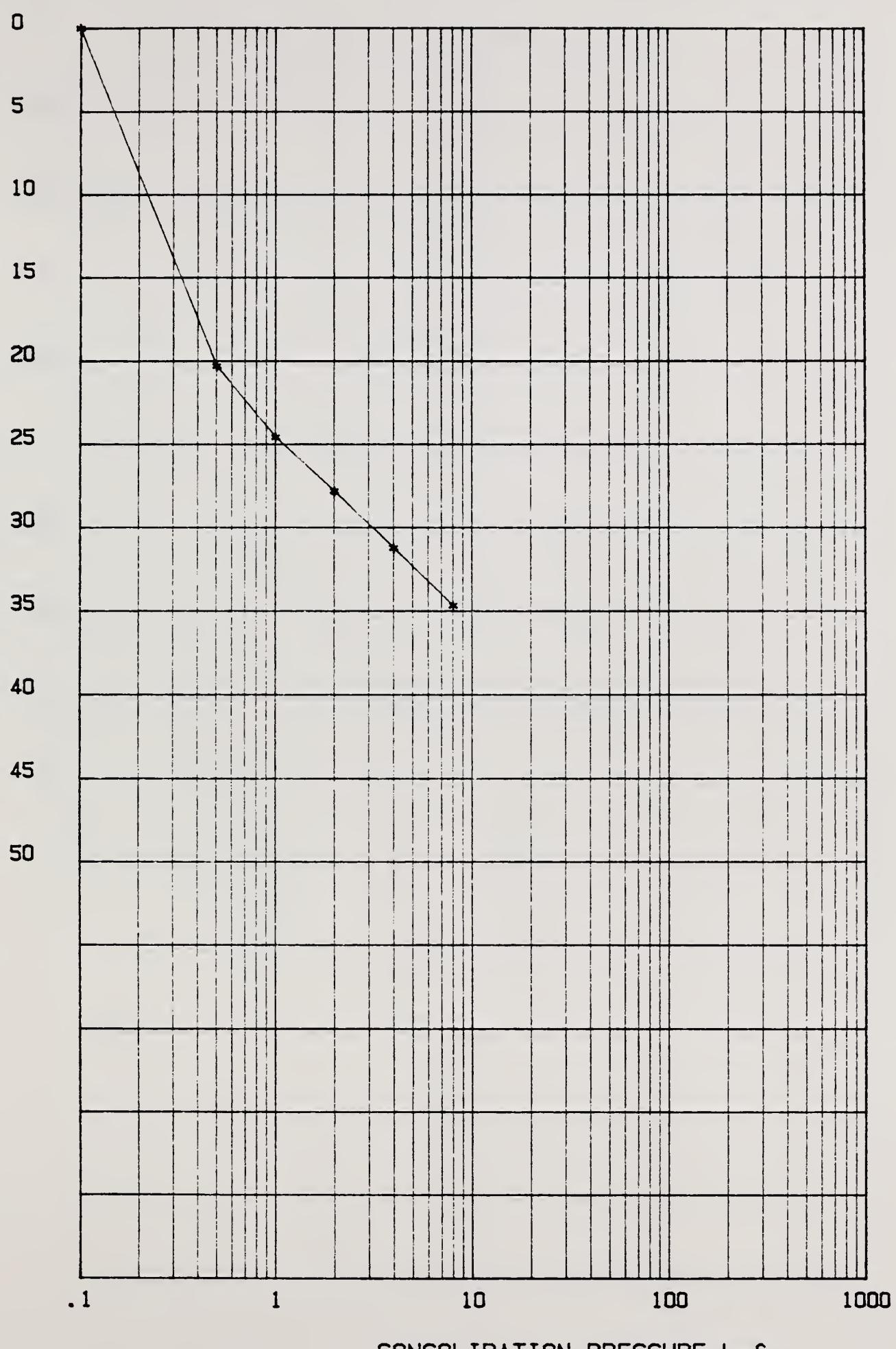
Sample description: COMPACTED TO 1.14 GM/CC CL LL=26 PI=9 SATURATED AT START OF TEST

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	100 g
INITIAL DRY WEIGHT:	92.34 g
INITIAL WATER CONTENT:	8.2 %
INITIAL WET DENSITY:	77.61 PCF
INITIAL DRY DENSITY:	71.665 PCF
SPECIFIC GRAVITY:	2.61
INITIAL VOID RATIO:	1.273
FINAL WET WEIGHT:	109.66 g
FINAL WATER CONTENT:	18.7 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	0.0000	1.2730	0.00
2.0	.50	.2034	.8110	20.34
3.0	1.00	.2463	.7130	24.63
4.0	2.00	.2787	.6390	27.87
5.0	4.00	.3130	.5610	31.30
6.0	8.00	.3477	.4830	34.77



PERCENT CONSOLIDATION-LAB. SAMPLE.

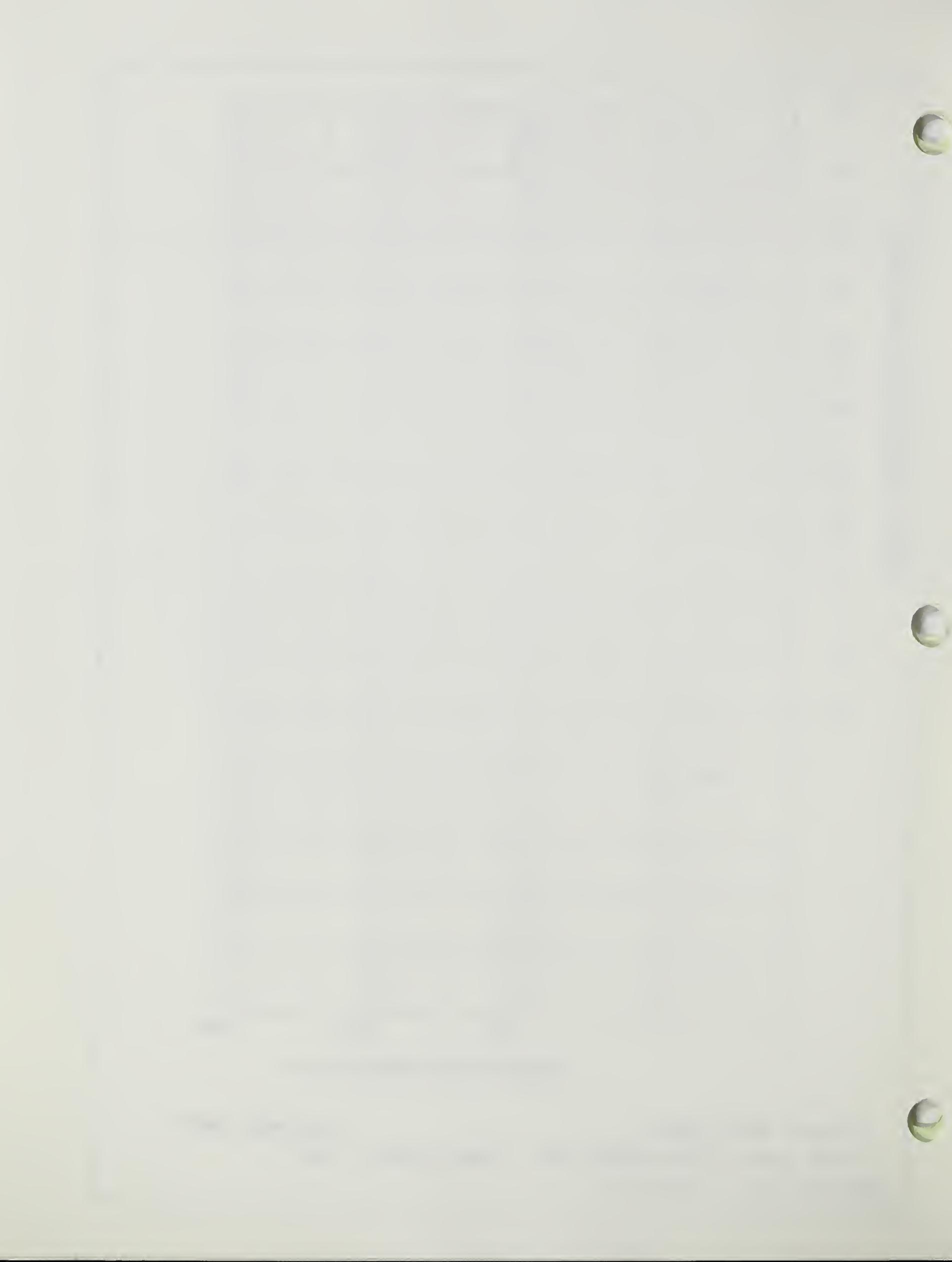


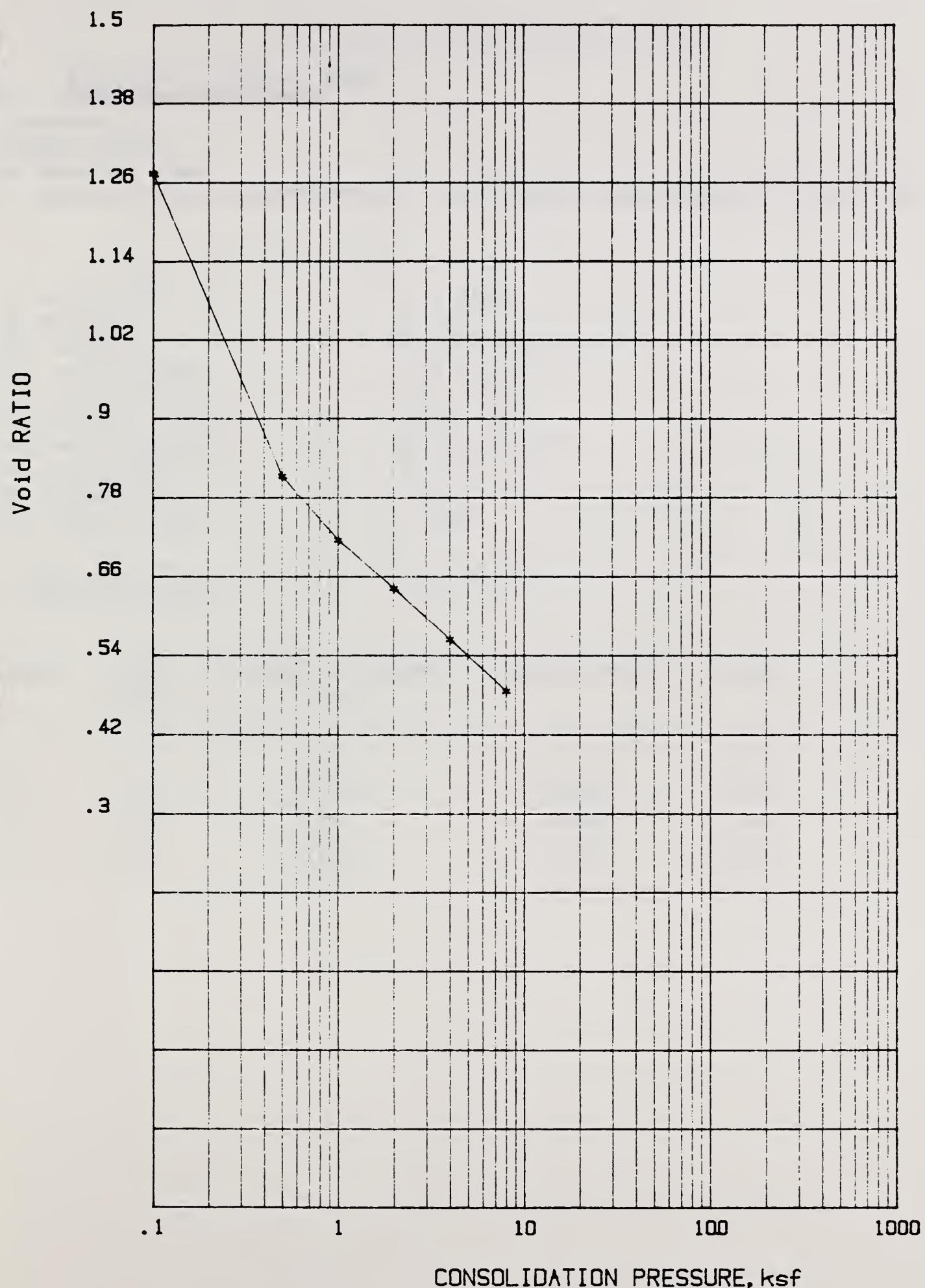
Project: WEPP SAMPLE

Field number: BARNES-MORRIS MN. Sample depth: Feet

LAB. NUMBER 88C91

USDA-SCS S. M. L. LINCOLN NE.



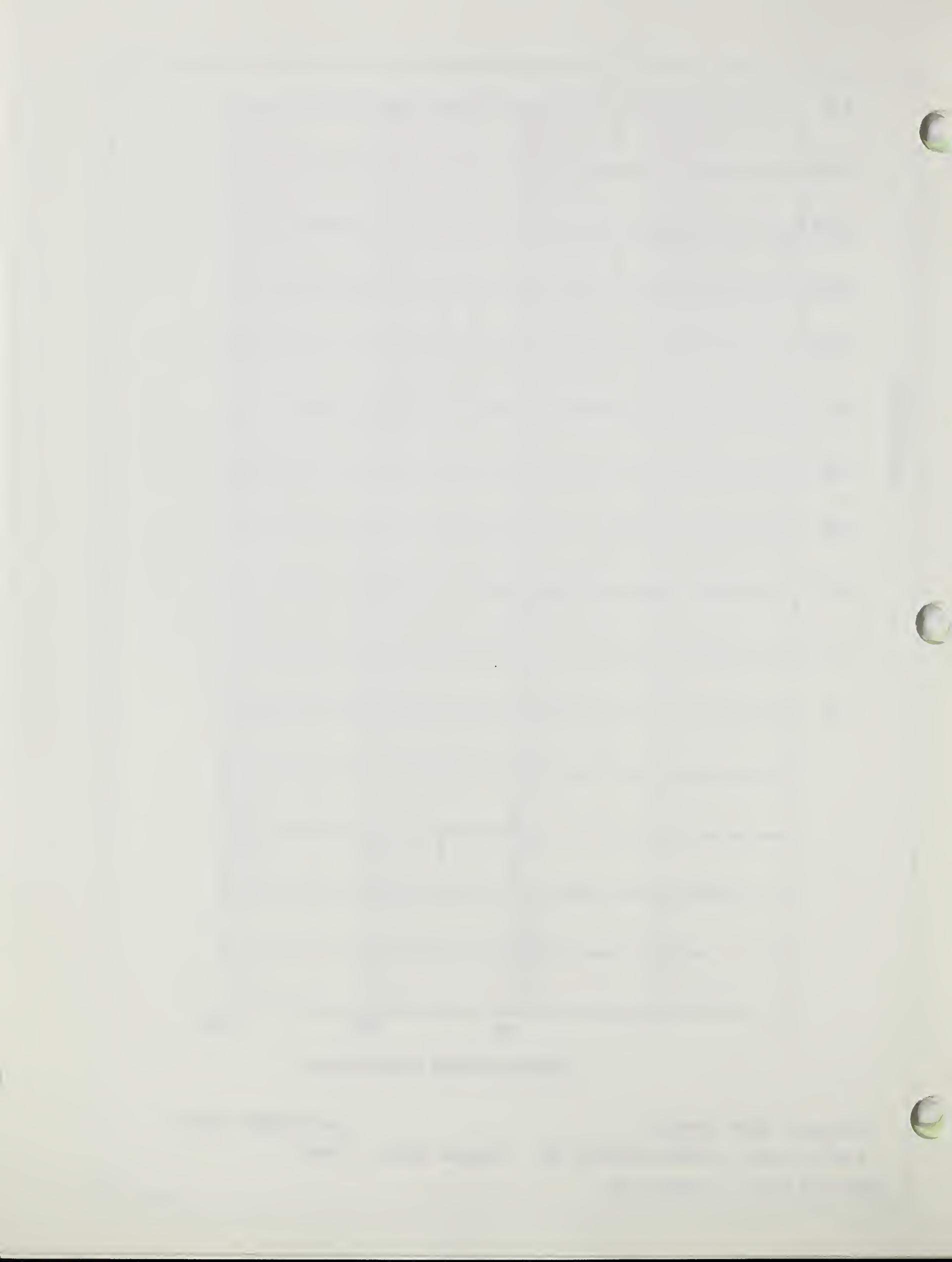


Project: WEPP SAMPLE

LAB. NUMBER 88C91

Field number: BARNES-MORRIS MN. Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



Test 2

RESULTS OF CONSOLIDATION TEST

*Barnes, Morris MN.*Project: ~~██████████~~

Field number:

LAB. NUMBER 88C91

Sample depth: Feet

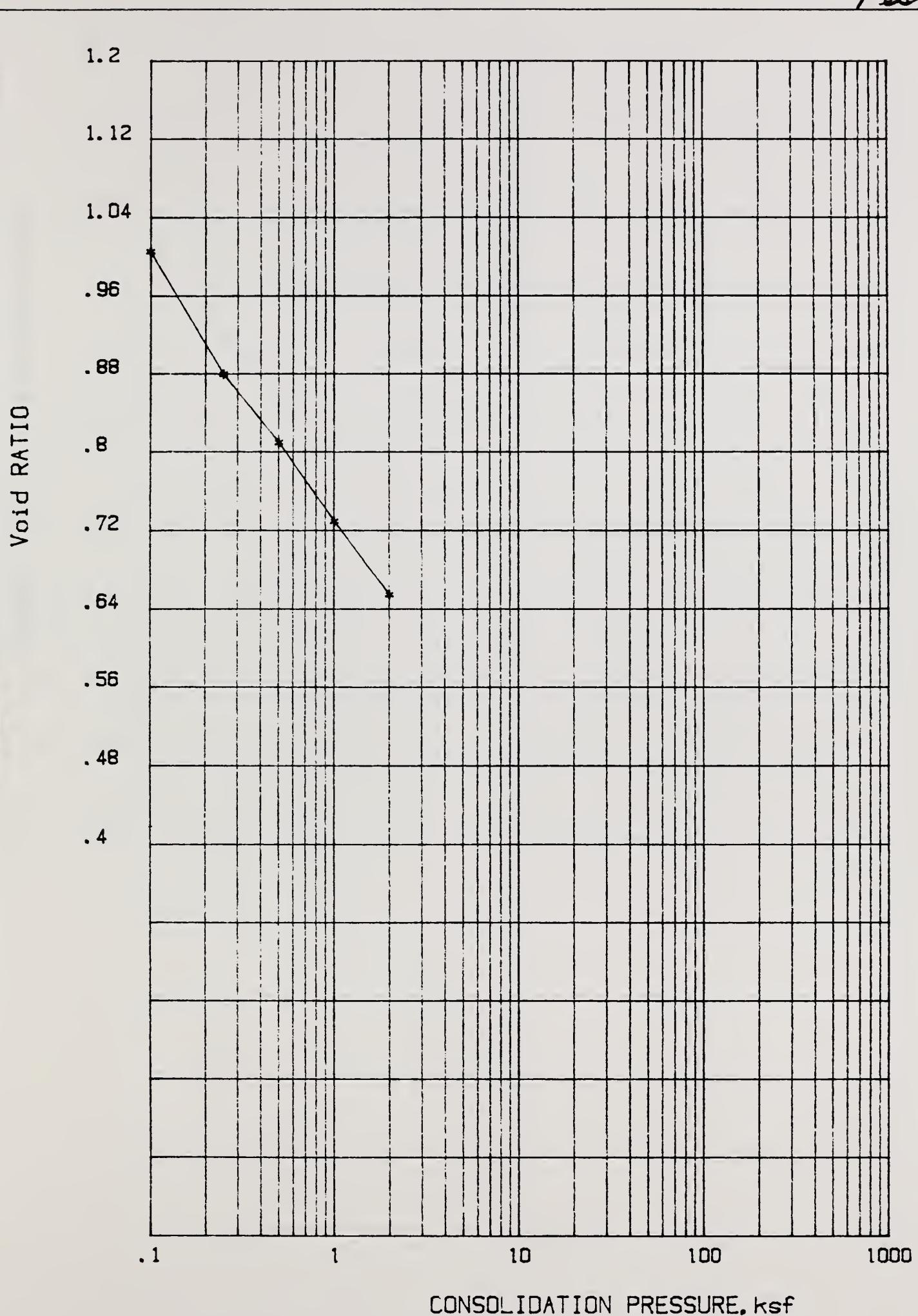
Sample description: COMPACTED TO 1.14 GMS/CC SATURATED AT START OF TEST

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	104.25 g
INITIAL DRY WEIGHT:	91.7 g
INITIAL WATER CONTENT:	13.6 %
INITIAL WET DENSITY:	80.909 PCF
INITIAL DRY DENSITY:	71.169 PCF
SPECIFIC GRAVITY:	2.61
INITIAL VOID RATIO:	1.289
FINAL WET WEIGHT:	113.66 g
FINAL WATER CONTENT:	23.9 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.1243	1.0040	12.43
2.0	.25	.1794	.8780	17.94
3.0	.50	.2101	.8080	21.01
4.0	1.00	.2451	.7280	24.51
5.0	2.00	.2779	.6530	27.79



Test 2



Project: Barnes Soil MN.

Field number:

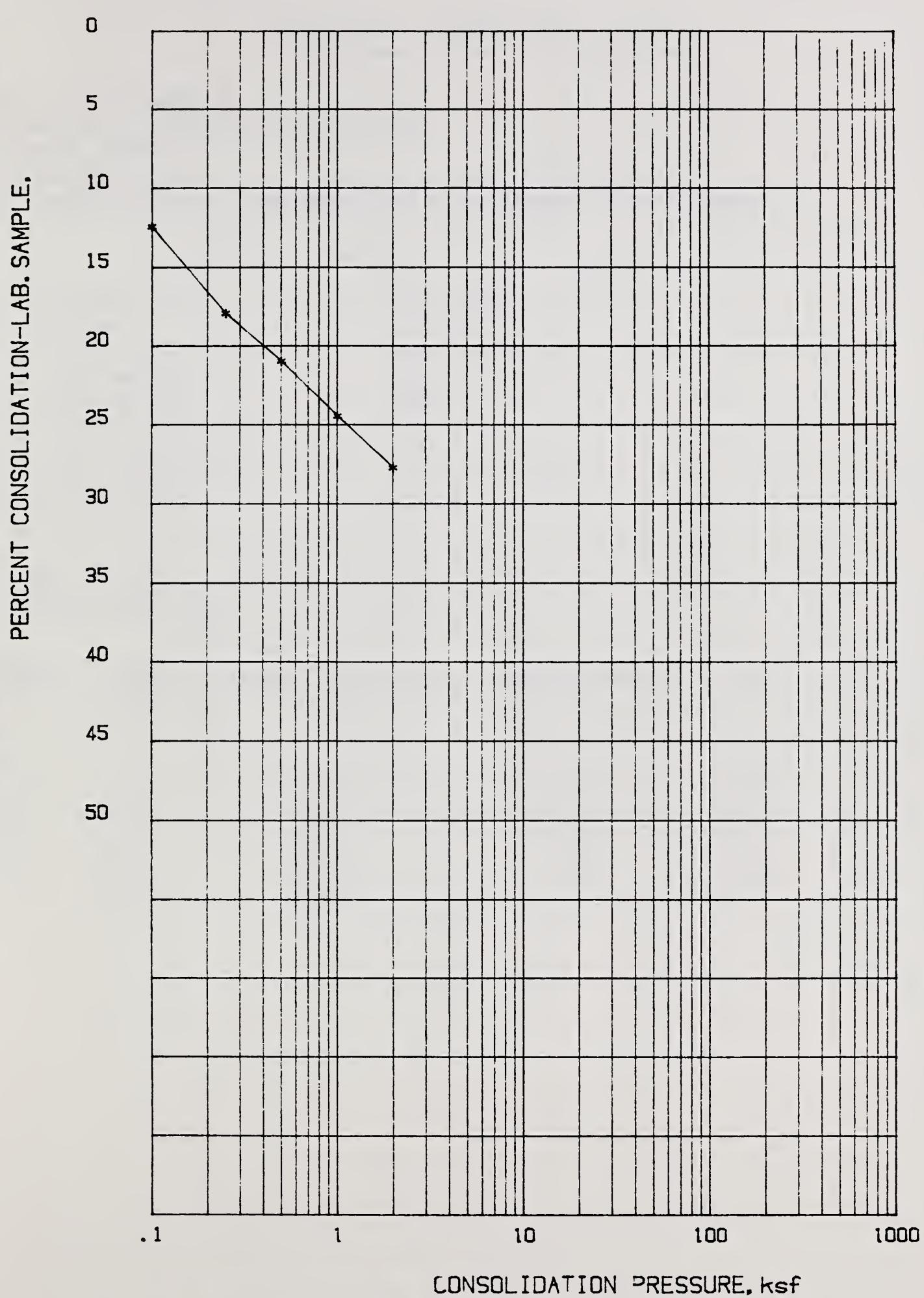
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C91

Sample depth: Feet



Test 2



Project:

Barnes Soil MN.

Field number:

LAB. NUMBER 88C91

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



RESULTS OF CONSOLIDATION TEST

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Project: WEPP SAMPLE

Field number: BARNES-McCLUSKY ND.

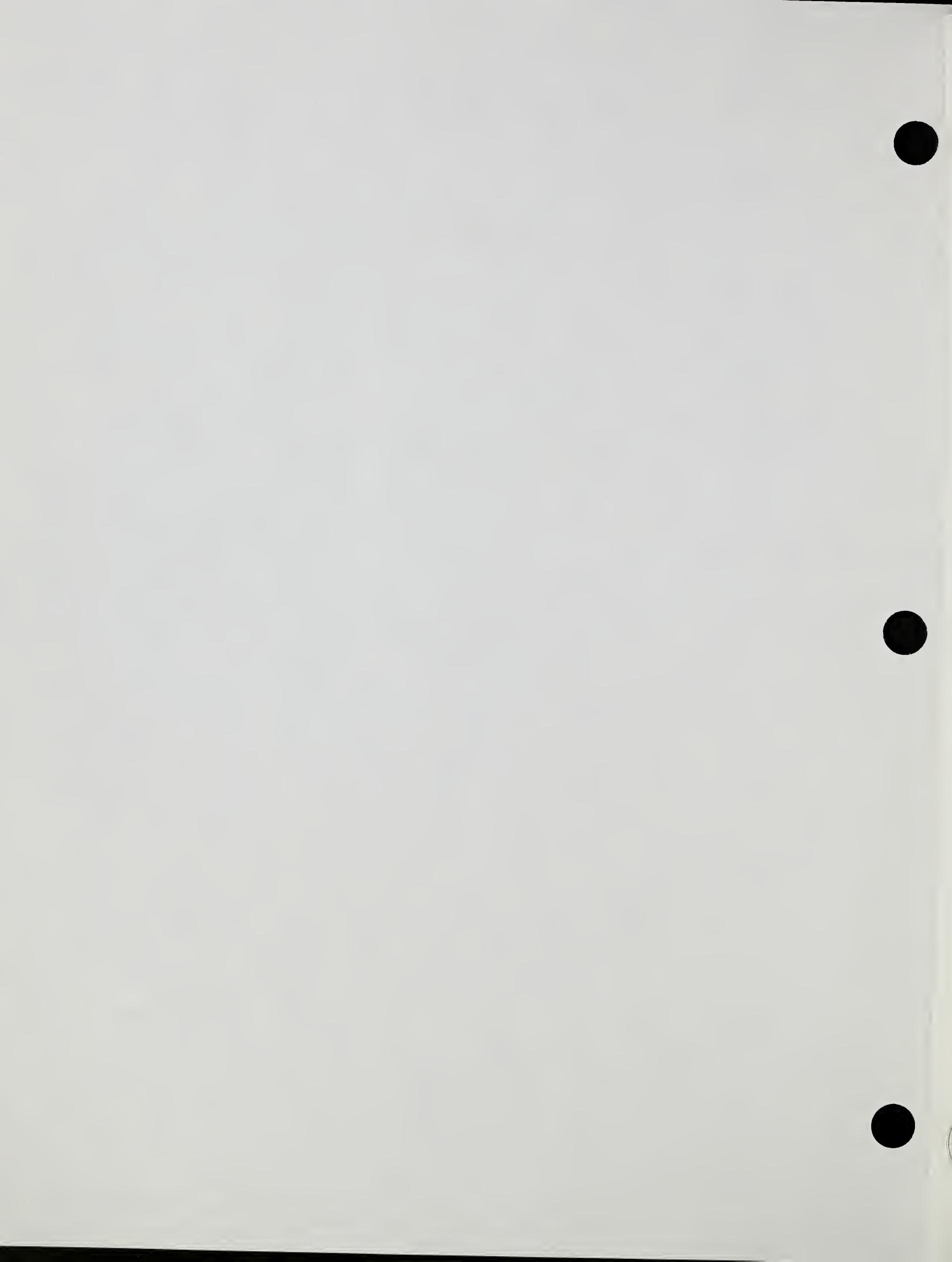
LAB. NUMBER 88C92

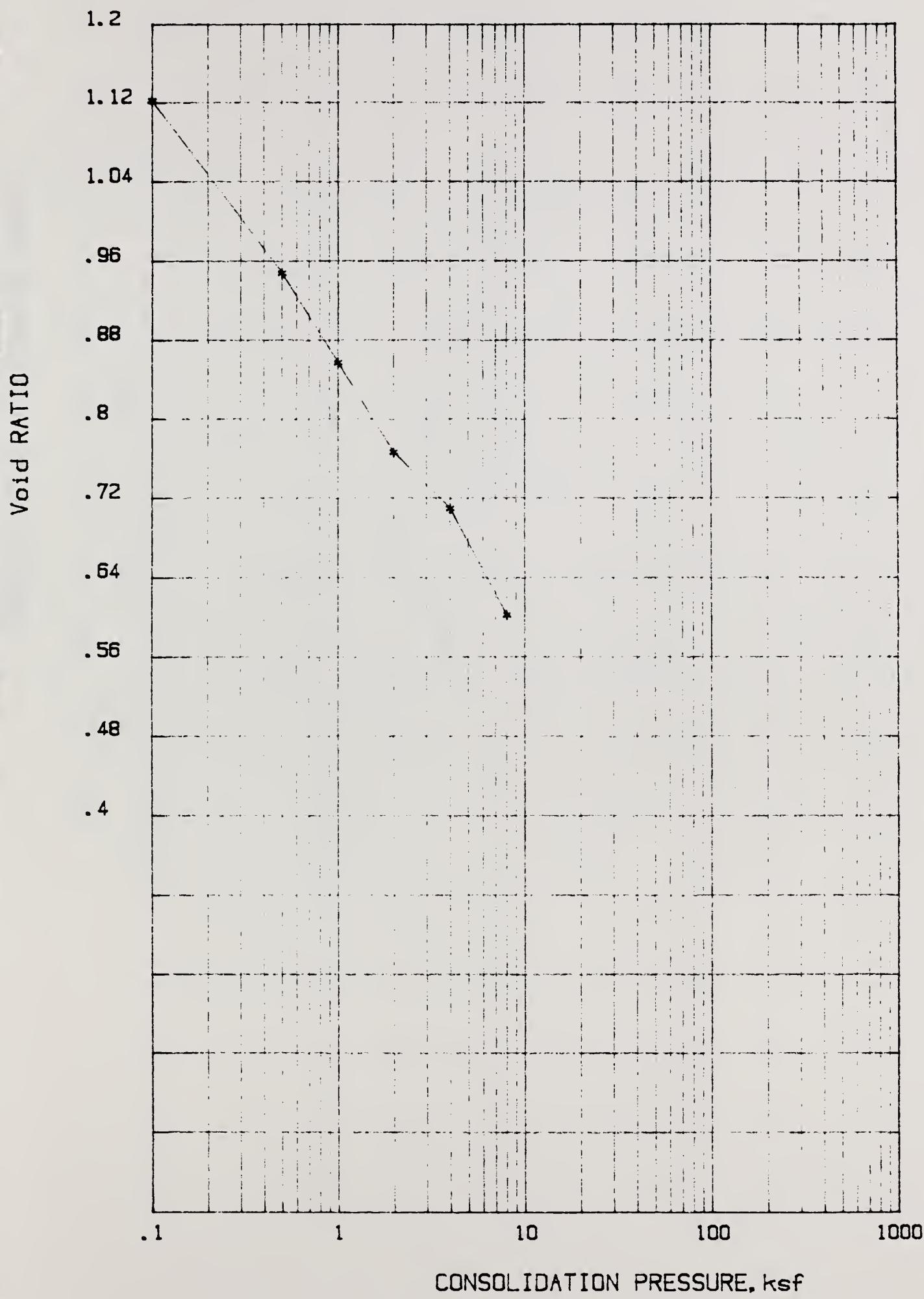
Sample depth: Feet

Sample description: COMPACTED TO 1.20 GM/CC LL=31 PI=12

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	104.23 g
INITIAL DRY WEIGHT:	96.67 g
INITIAL WATER CONTENT:	7.8 %
INITIAL WET DENSITY:	80.893 PCF
INITIAL DRY DENSITY:	75.026 PCF
SPECIFIC GRAVITY:	2.55
INITIAL VOID RATIO:	1.121
FINAL WET WEIGHT:	108.14 g
FINAL WATER CONTENT:	11.8 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	0.0000	1.1210	0.00
2.0	.50	.0823	.9470	8.23
3.0	1.00	.1252	.8560	12.52
4.0	2.00	.1681	.7650	16.81
5.0	4.00	.1948	.7080	19.48
6.0	8.00	.2454	.6010	24.54



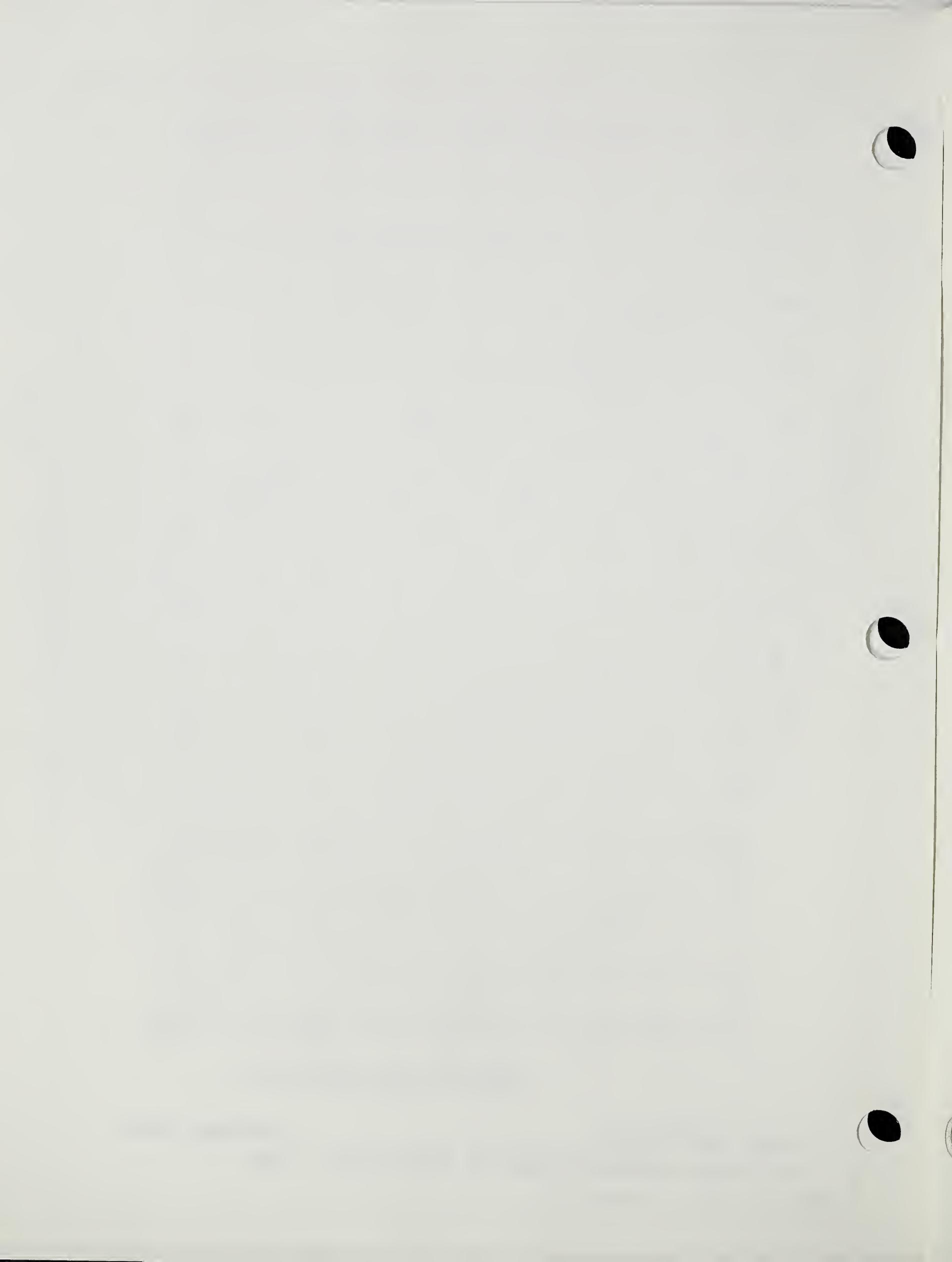


Project: WEPP SAMPLE

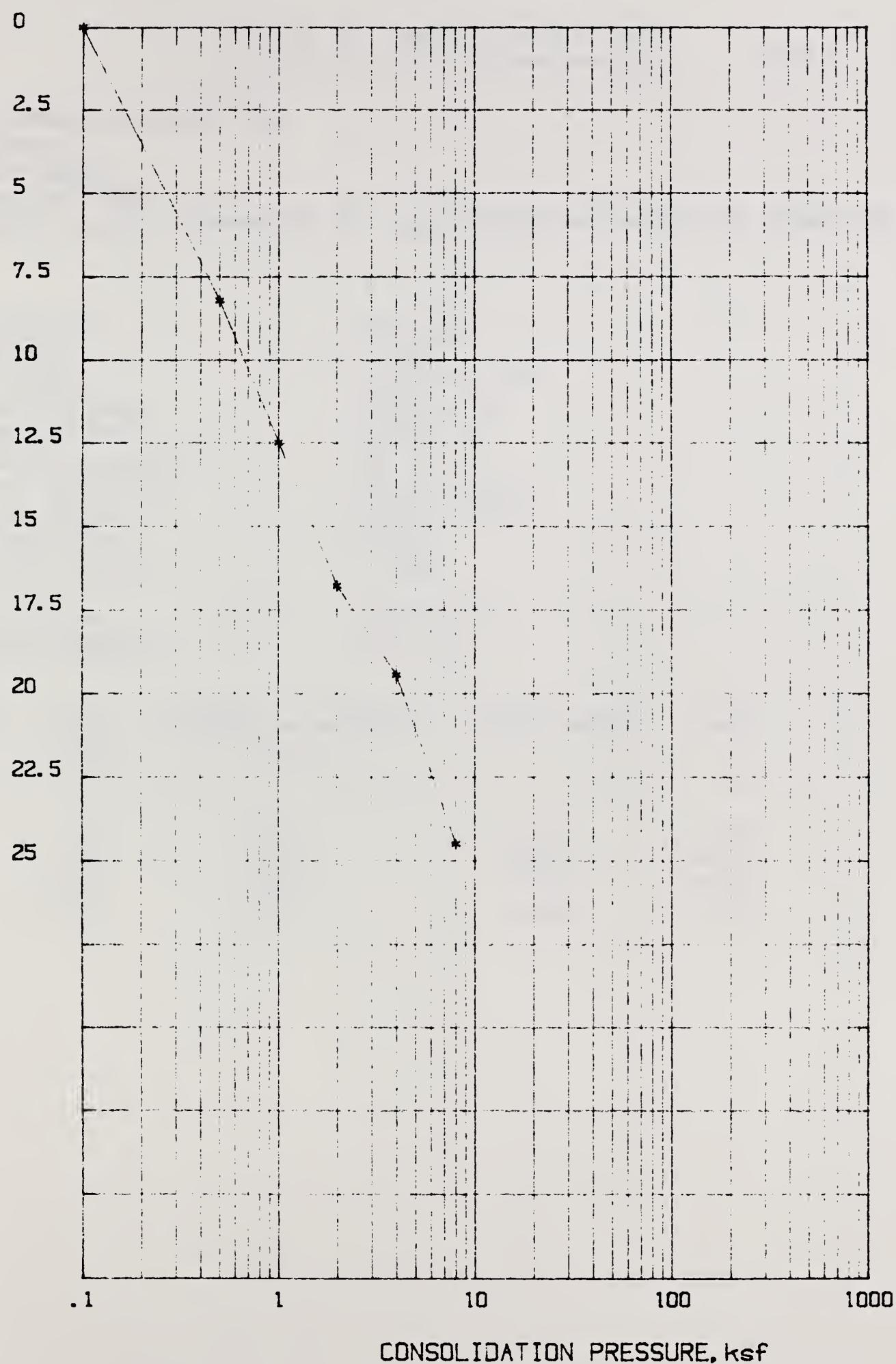
LAB. NUMBER 88C92

Field number: BARNES-McCLUSKY ND. Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



PERCENT CONSOLIDATION-LAB. SAMPLE.



Project: WEPP SAMPLE

LAB. NUMBER 88C92

Field number: BARNES-McCLUSKY ND. Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.

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RESULTS OF CONSOLIDATION TEST
=====

Test #2

Project: BARNES-McCLUSKY ND.

Field number:

LAB. NUMBER 88C92

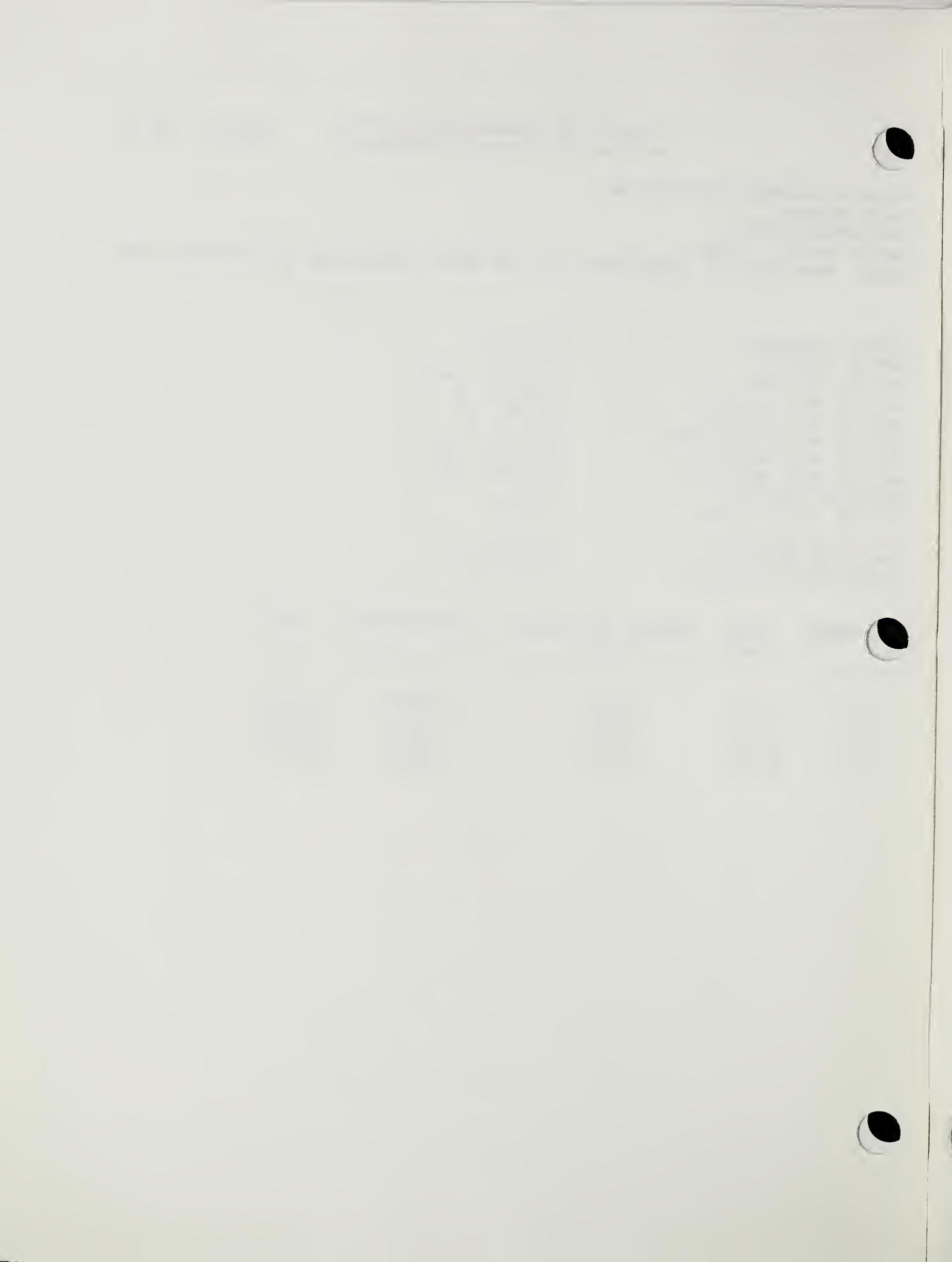
Sample depth: Feet

Sample description: COMPACTED TO 1.20 GM/CC SATURATED AT START OF TEST

SAMPLE DIAMETER: 2.5 ins
SAMPLE HEIGHT: 1 ins
INITIAL VOLUME: 80.439 cm³
INITIAL WET WEIGHT: 108.16 g
INITIAL DRY WEIGHT: 96.52 g
INITIAL WATER CONTENT: 12 %
INITIAL WET DENSITY: 83.943 PCF
INITIAL DRY DENSITY: 74.909 PCF
SPECIFIC GRAVITY: 2.55
INITIAL VOID RATIO: 1.125

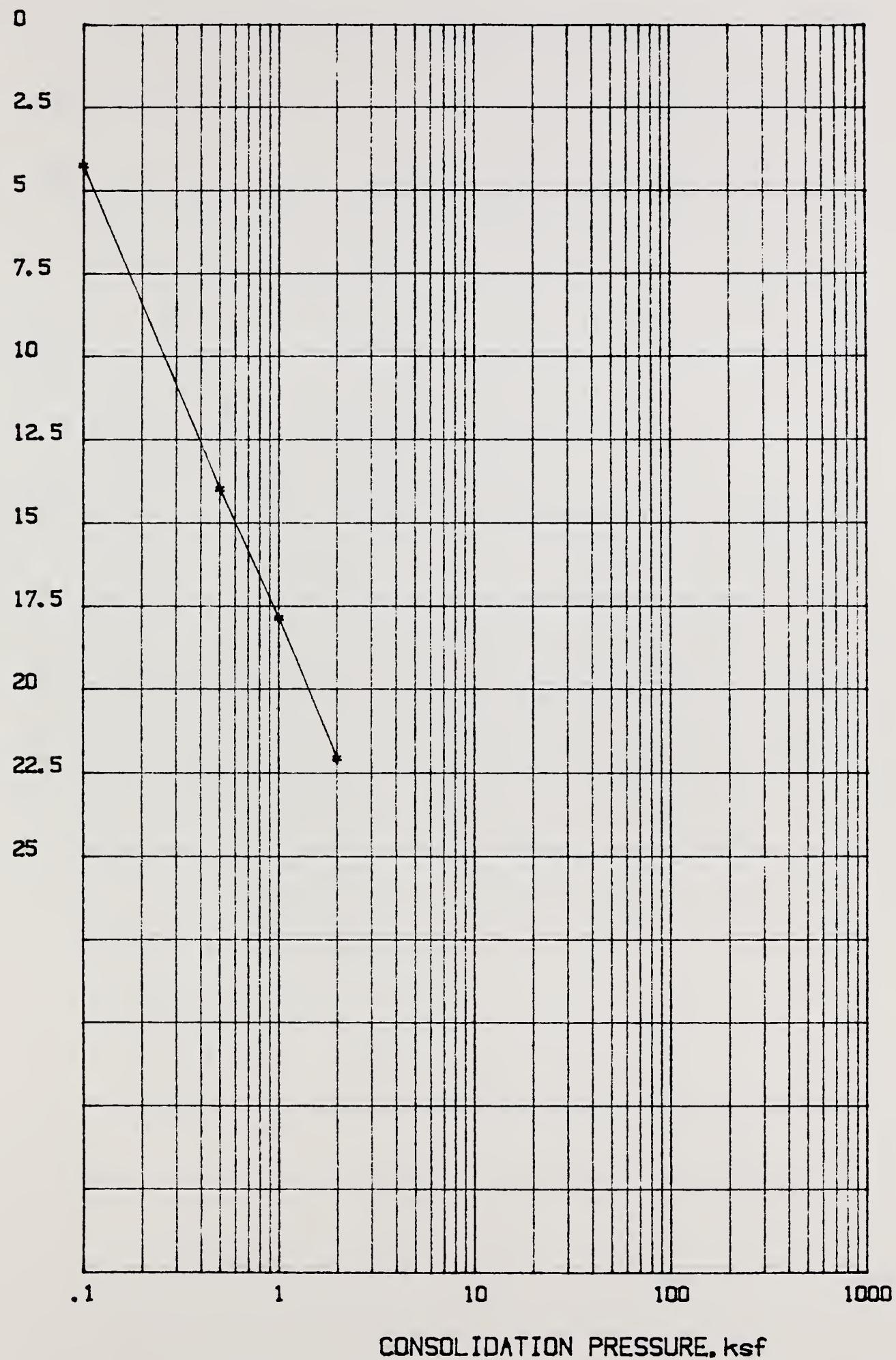
FINAL WET WEIGHT: 122.96 g
FINAL WATER CONTENT: 27.3 %

ELEMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.0425	1.0340	4.25
2.0	.50	.1400	.8270	14.00
3.0	1.00	.1789	.7440	17.89
4.0	2.00	.2210	.6550	22.10



Test No. 2

PERCENT CONSOLIDATION-LAB. SAMPLE.



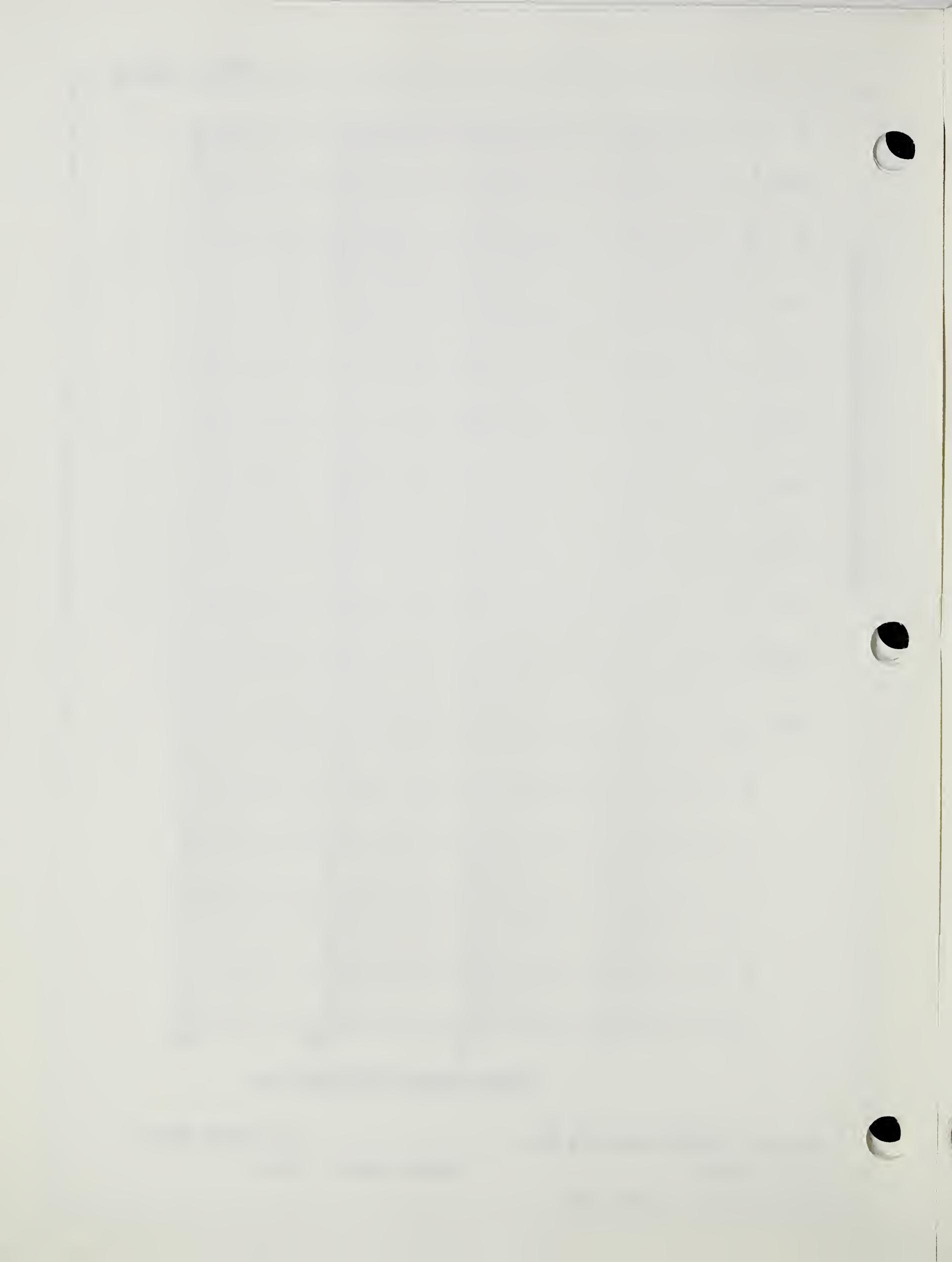
Project: BARNES-McCLUSKY ND.

LAB. NUMBER 88C92

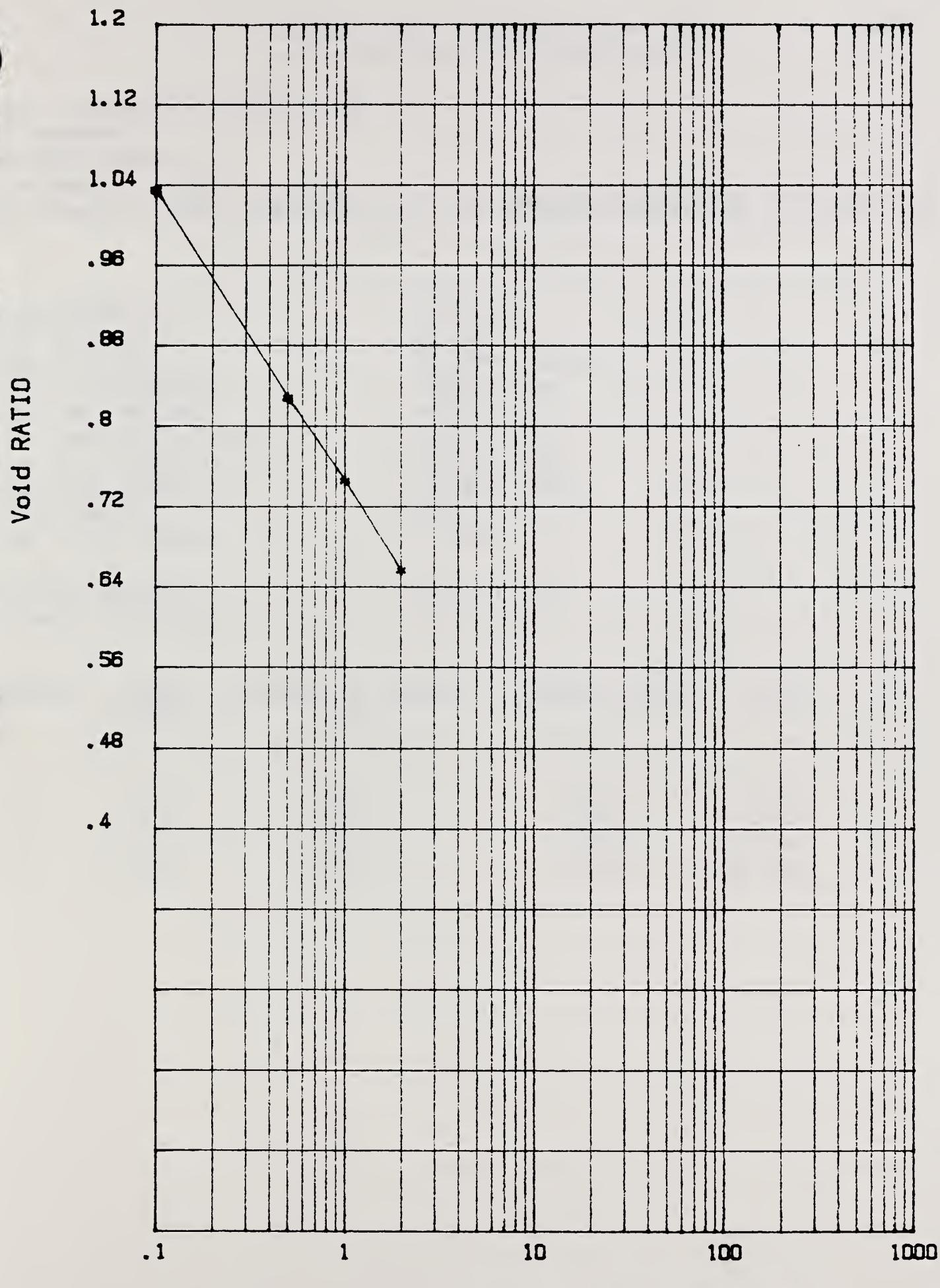
Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



Test No. 2



Project: BARNES-McCLUSKY ND.

LAB. NUMBER 88C92

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.

REF ID:

RESULTS OF CONSOLIDATION TEST

#3

Test

Project: BARNES--McCLUSKY ND

Field number:

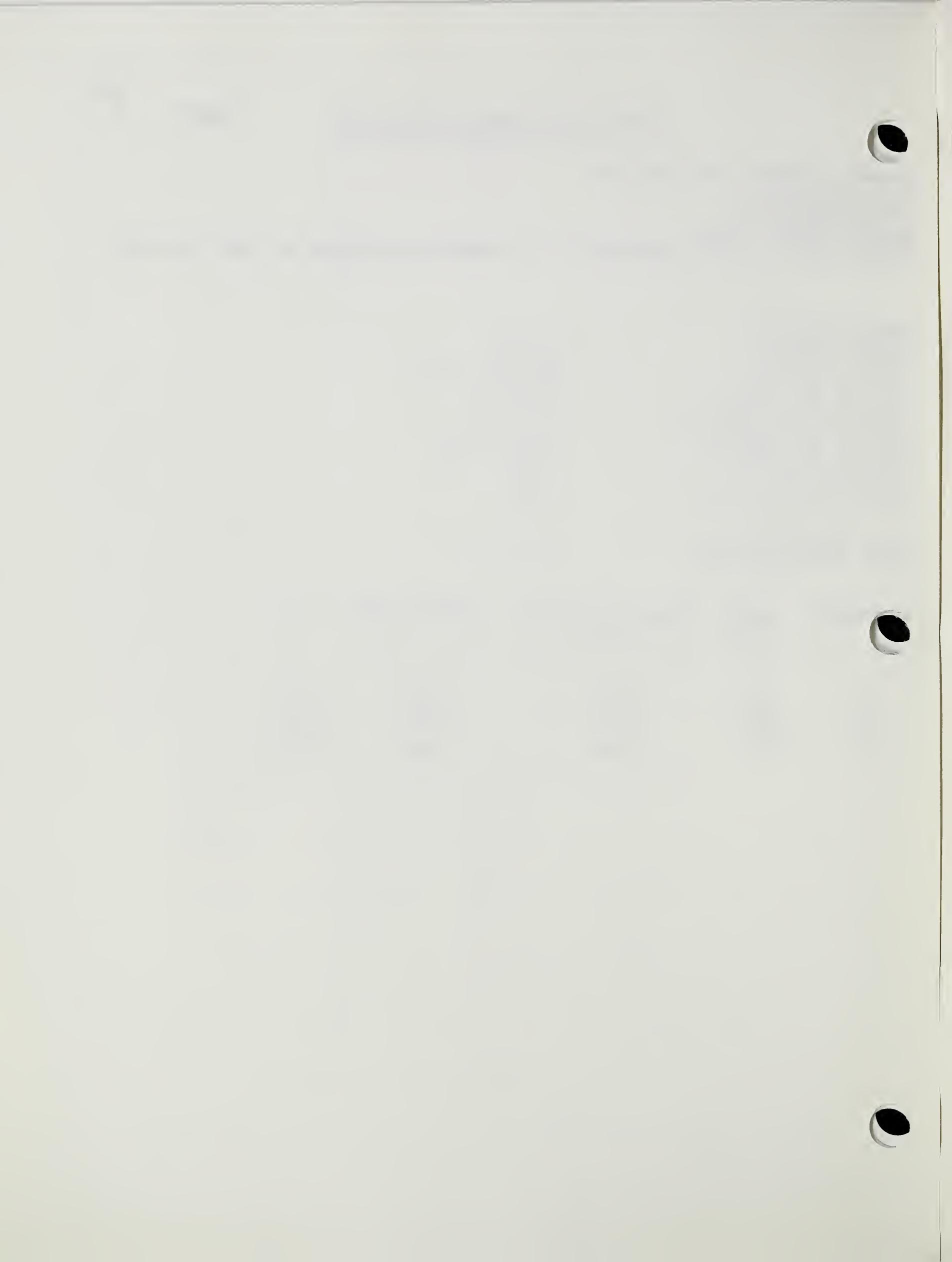
LAB. NUMBER 88C92

Sample depth: Feet

Sample description: COMPATED TO 1.20 GMS/CC SATURATED AT START OF TEST

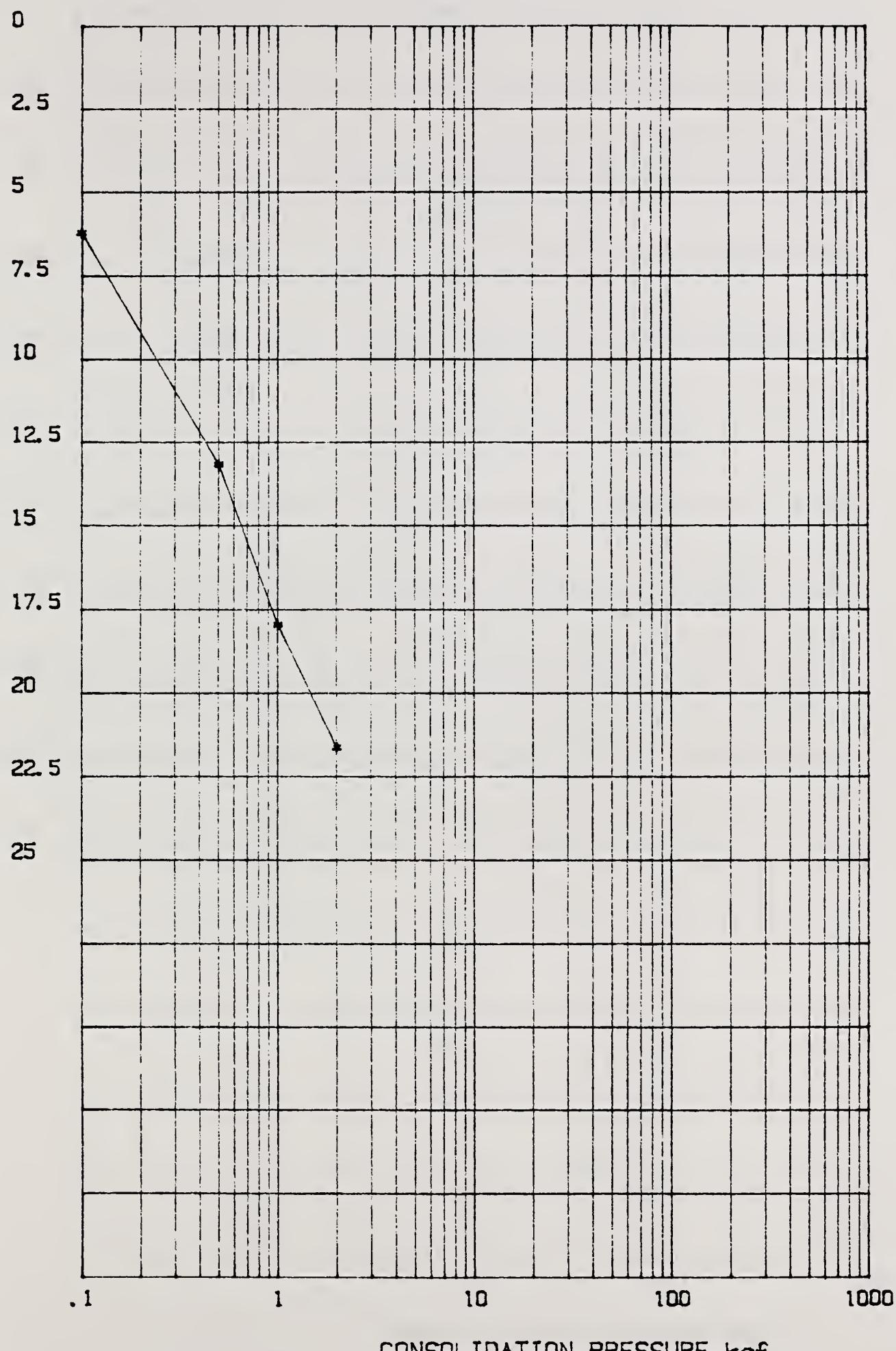
SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	108.04 g
INITIAL DRY WEIGHT:	96.52 g
INITIAL WATER CONTENT:	11.9 %
INITIAL WET DENSITY:	83.85 PCF
INITIAL DRY DENSITY:	74.909 PCF
SPECIFIC GRAVITY:	2.55
INITIAL VOID RATIO:	1.125
FINAL WET WEIGHT:	122.11 g
FINAL WATER CONTENT:	26.5 %

MATERIAL	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
	1.0	.0622	.9920	6.22
	2.0	.1320	.8440	13.20
	3.0	.1799	.7420	17.99
	4.0	.2168	.6640	21.68



Test No. 3

PERCENT CONSOLIDATION-LAB. SAMPLE.



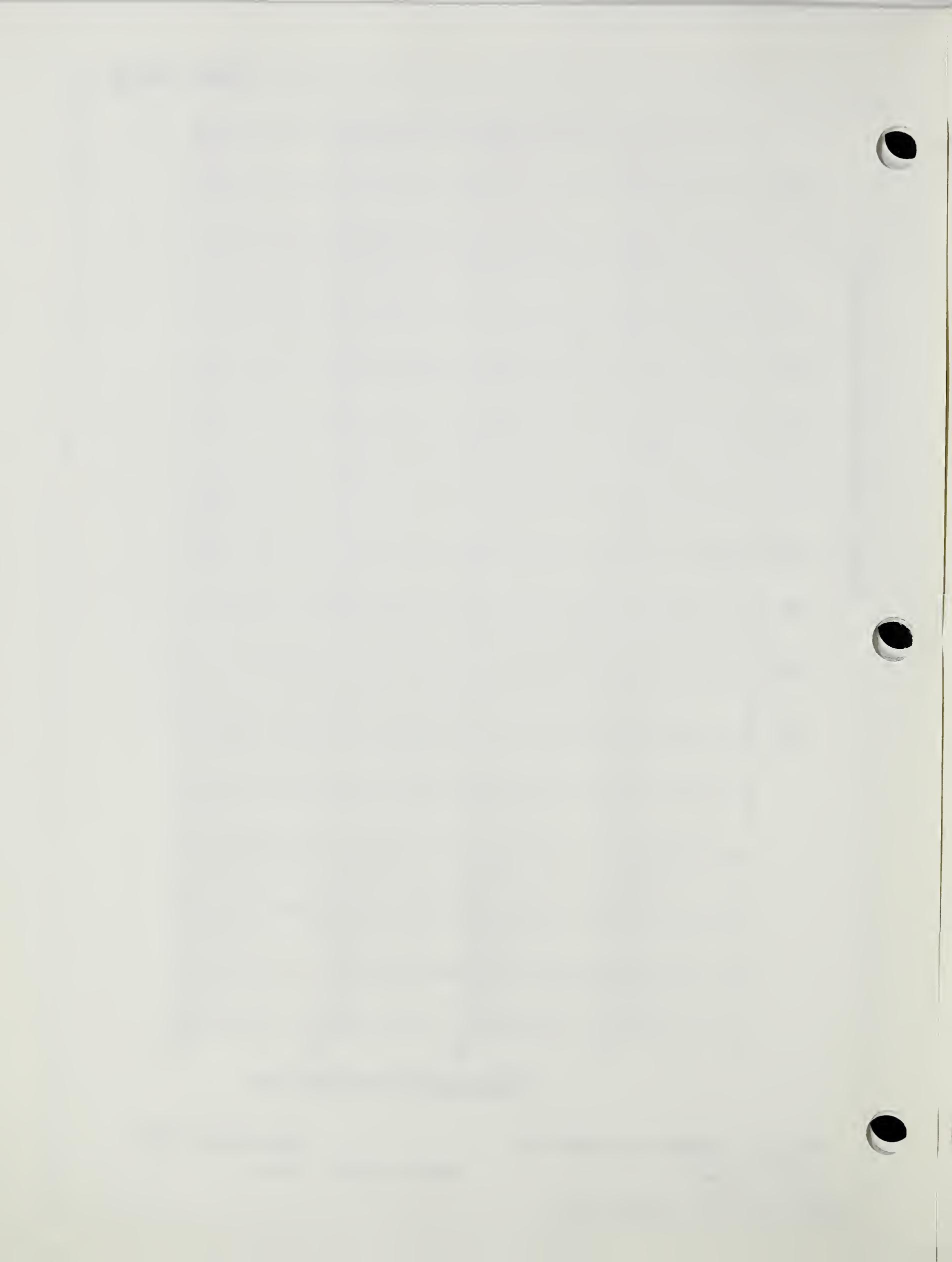
Project: BARNES--McCLUSKY ND

LAB. NUMBER 88C92

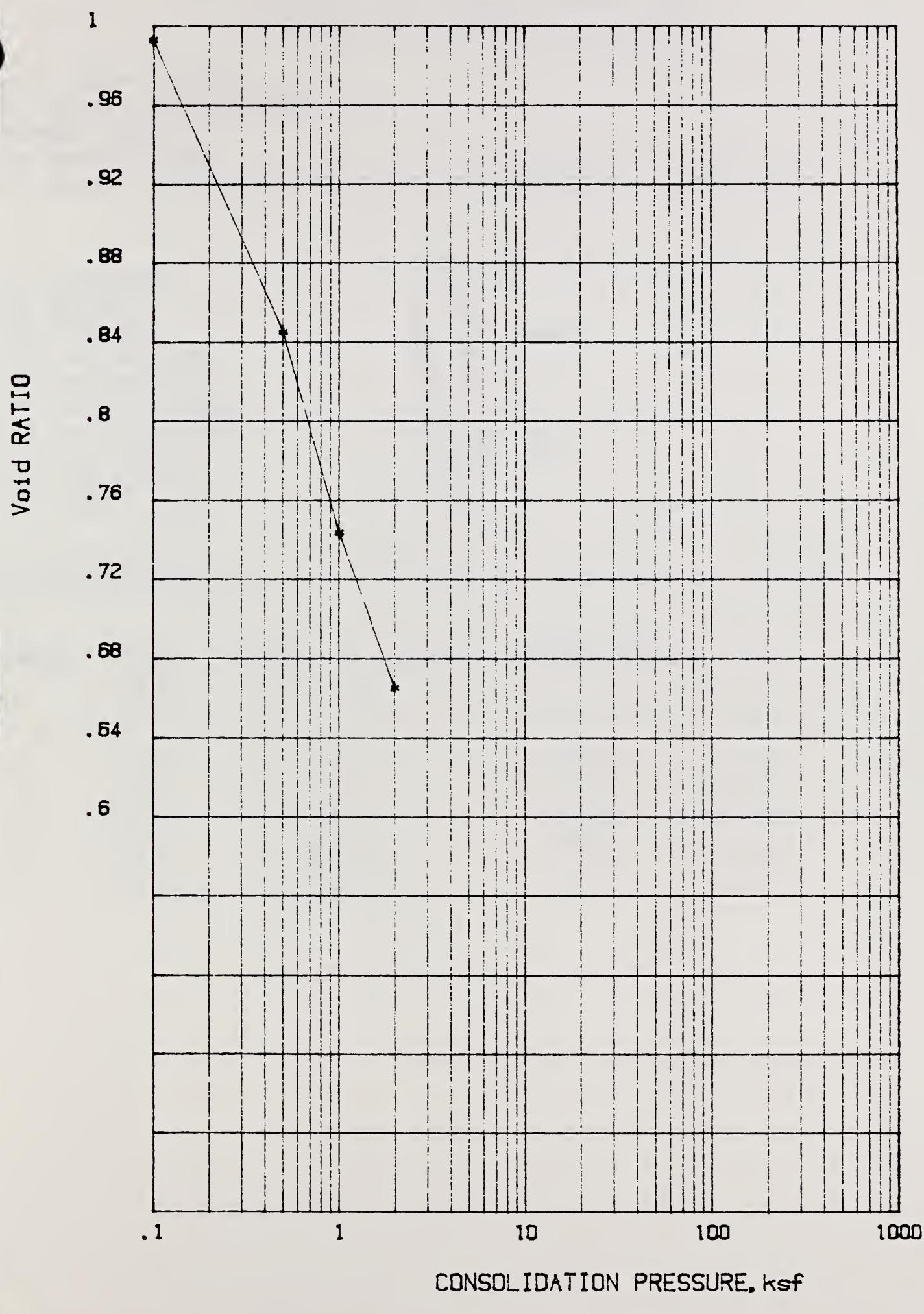
Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



Test No. 3



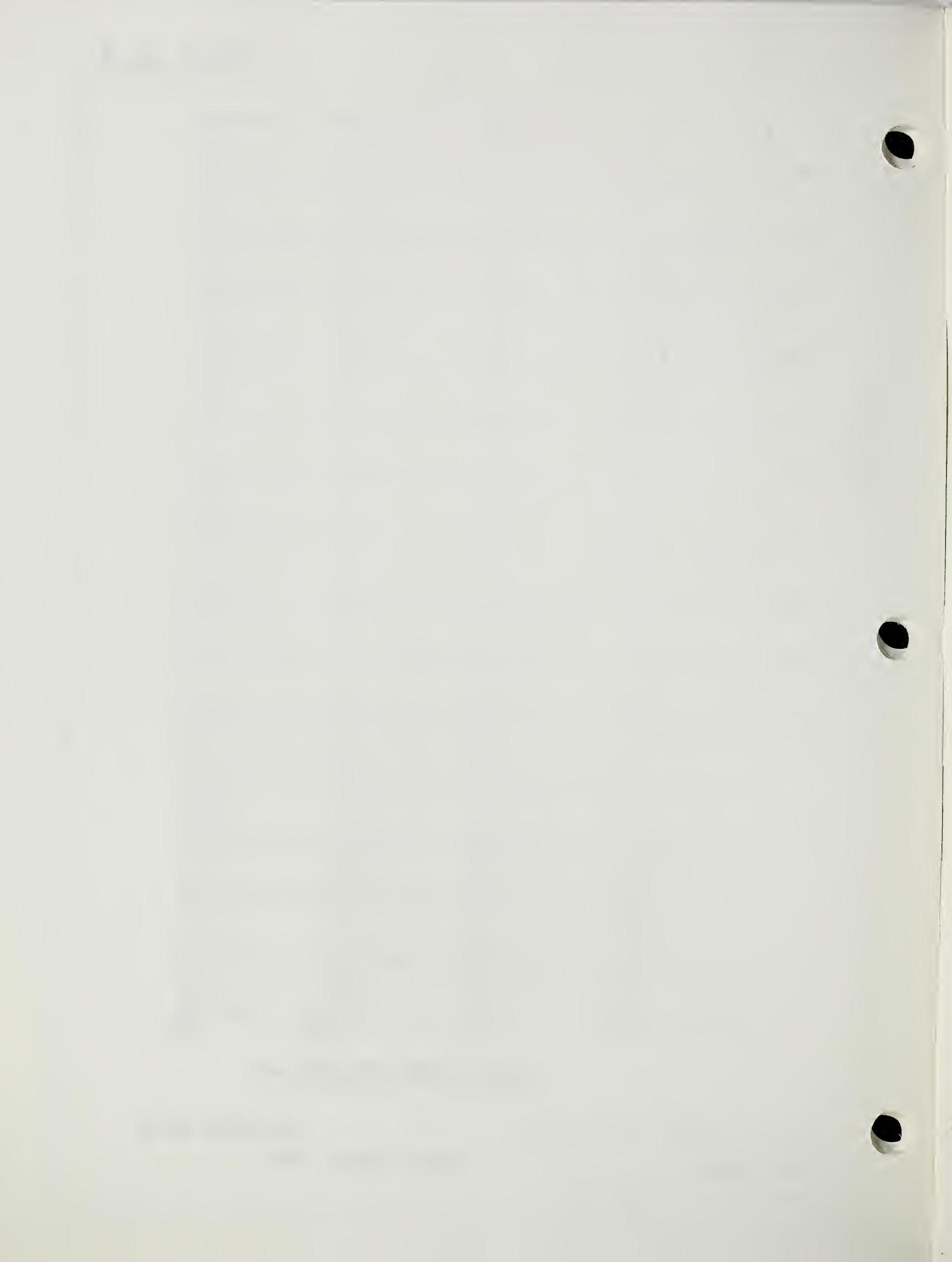
Project: BARNES--McCLUSKY ND

AB. NUMBER 88C92

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



RESULTS OF CONSOLIDATION TEST

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Project: WEPP SAMPLE

Field number: HEIDEN-WACO TX.

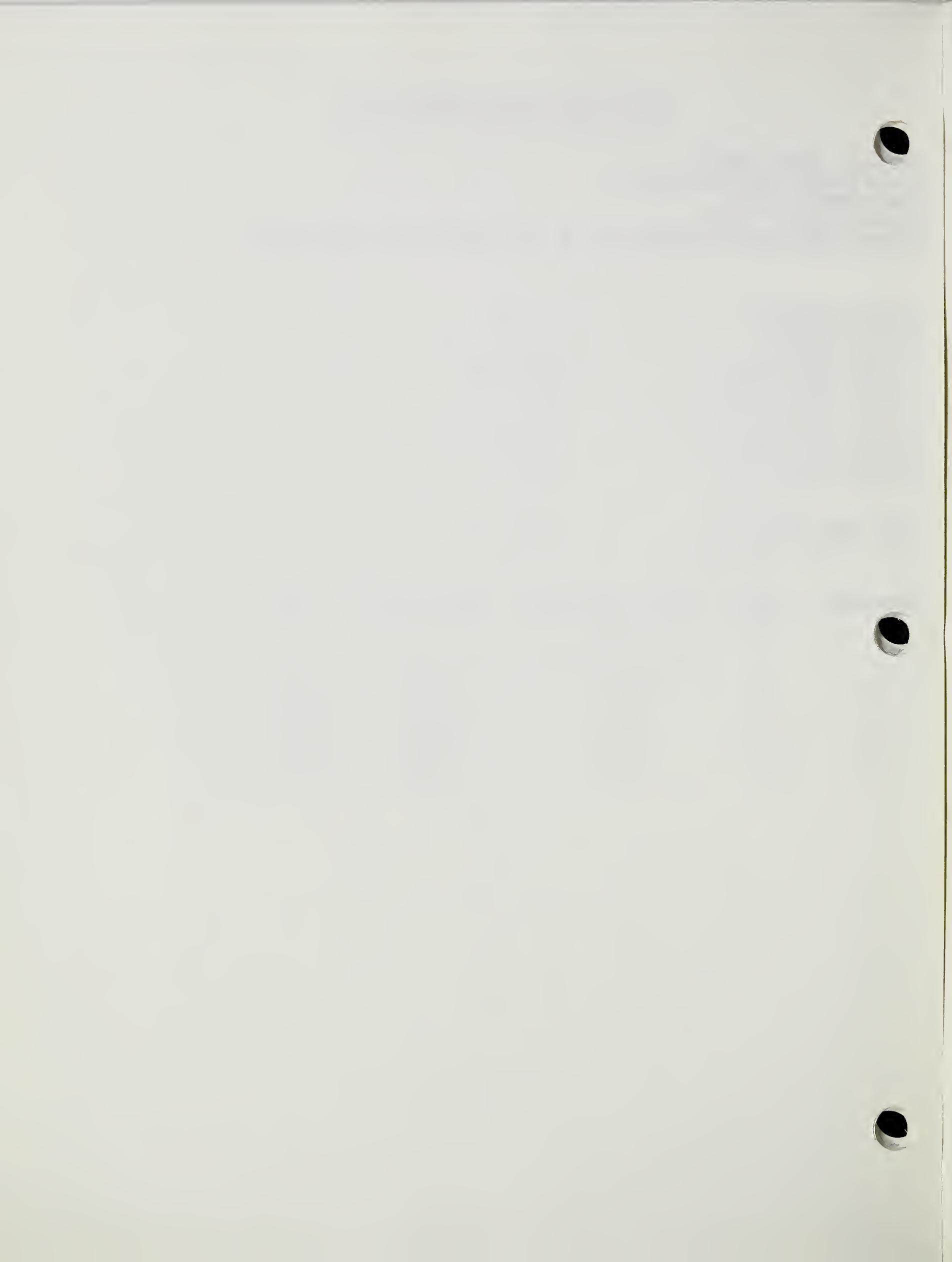
LAB. NUMBER 88C93

Sample depth: Feet

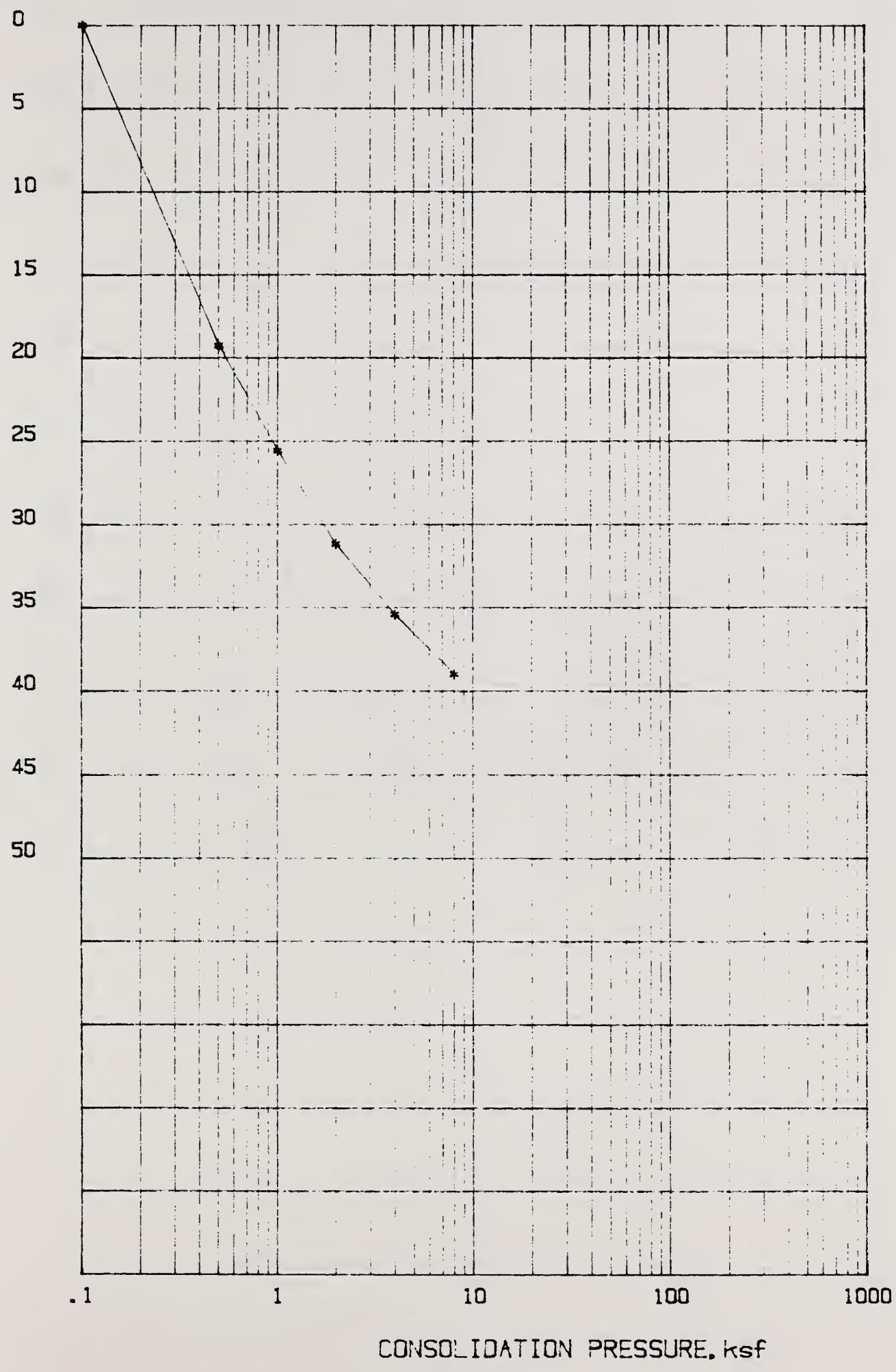
Sample description: COMPACTED TO .99 GMS/CC CH LL=52 PI=37

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	95.78 g
INITIAL DRY WEIGHT:	79.73 g
INITIAL WATER CONTENT:	20.1 %
INITIAL WET DENSITY:	74.335 PCF
INITIAL DRY DENSITY:	61.879 PCF
SPECIFIC GRAVITY:	2.67
INITIAL VOID RATIO:	1.693
FINAL WET WEIGHT:	91.67 g
FINAL WATER CONTENT:	14.9 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	0.0000	1.6930	0.00
2.0	.50	.1931	1.1730	19.31
3.0	1.00	.2561	1.0030	25.61
4.0	2.00	.3123	.8520	31.23
5.0	4.00	.3548	.7380	35.48
6.0	8.00	.3907	.6410	39.07



PERCENT CONSOLIDATION-LAB. SAMPLE,



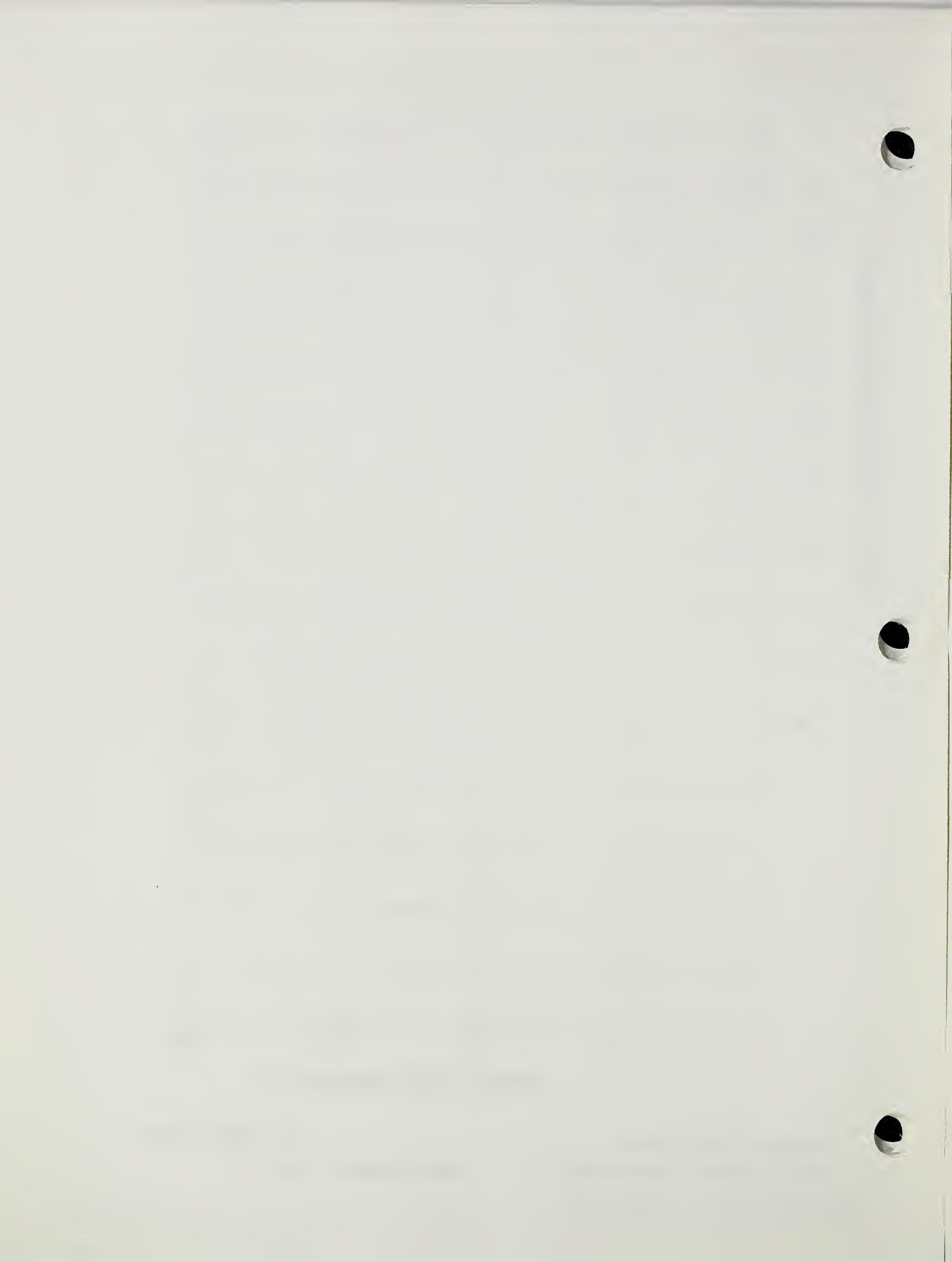
Project: WEPP SAMPLE

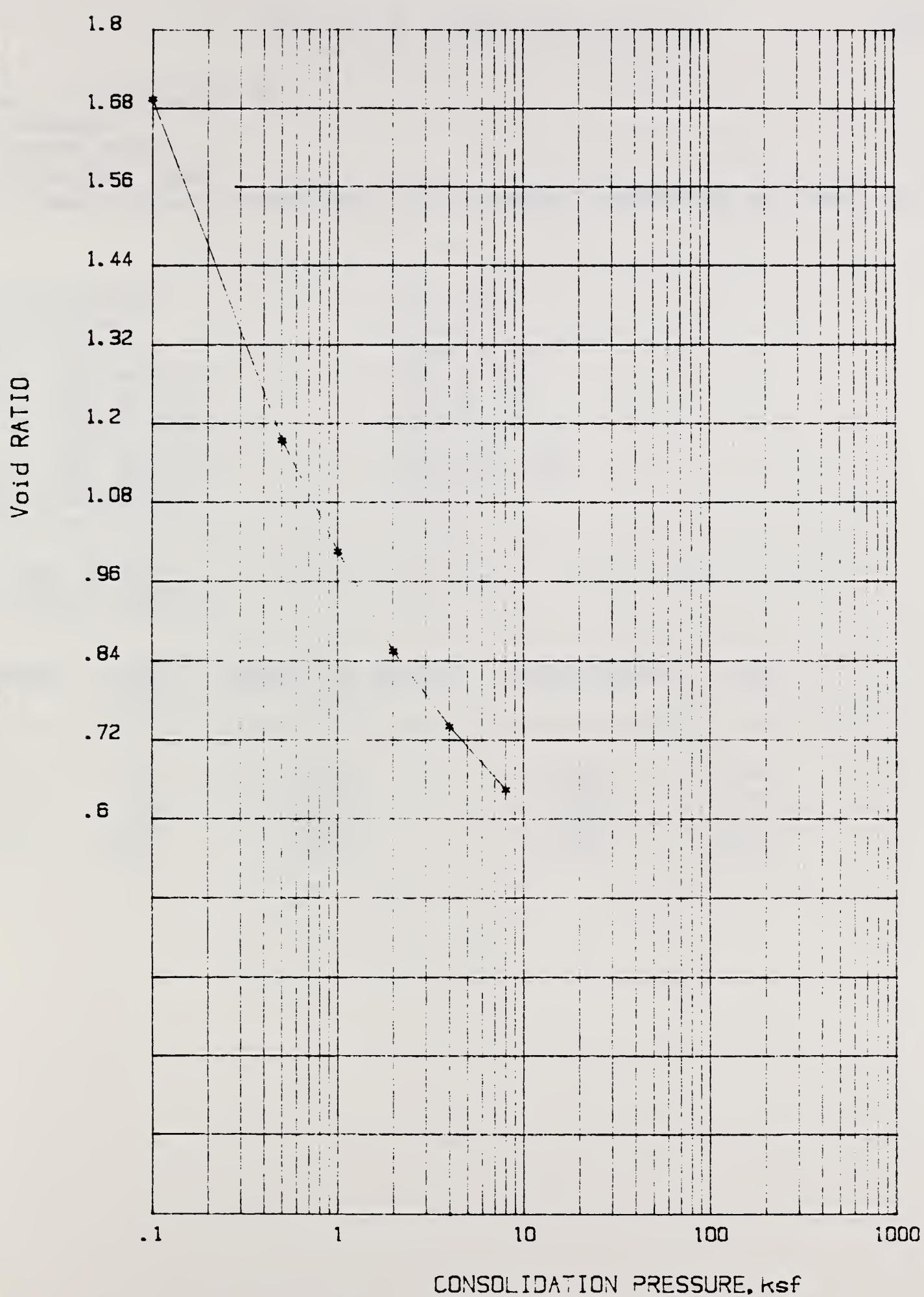
LAB. NUMBER 88C93

Field number: HEIDEN-WACO TX.

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.





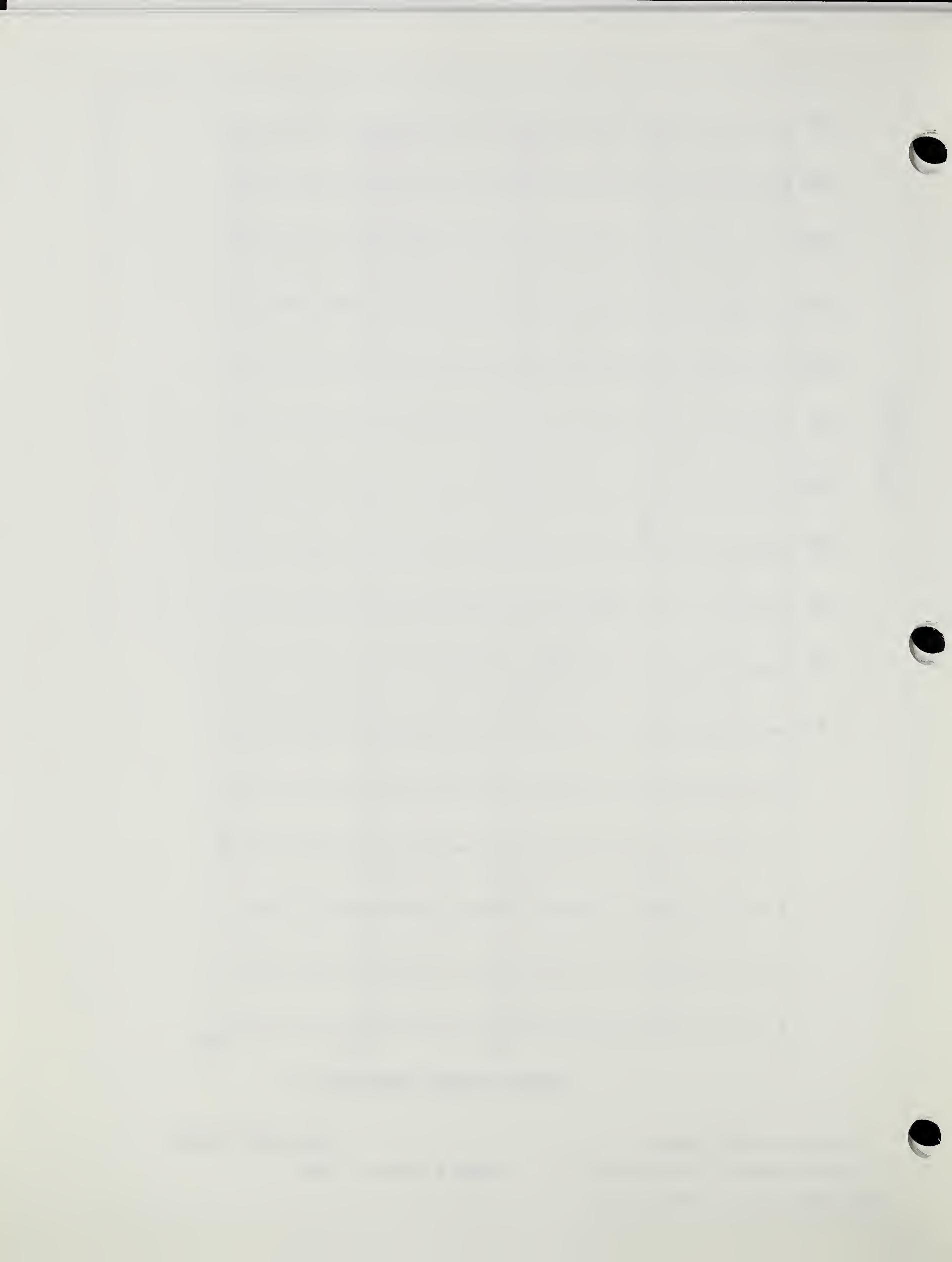
Project: WEPP SAMPLE

Field number: HEIDEN-WACO TX.

LAB. NUMBER 88C93

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



RESULTS OF CONSOLIDATION TEST
=====

Test #2

Project: HEIDEN-WACO TX.

Field number:

LAB. NUMBER 88C93

Sample depth: Feet

Sample description: COMPACTED TO .99 GMS/CC SATURATED AT START OF TEST

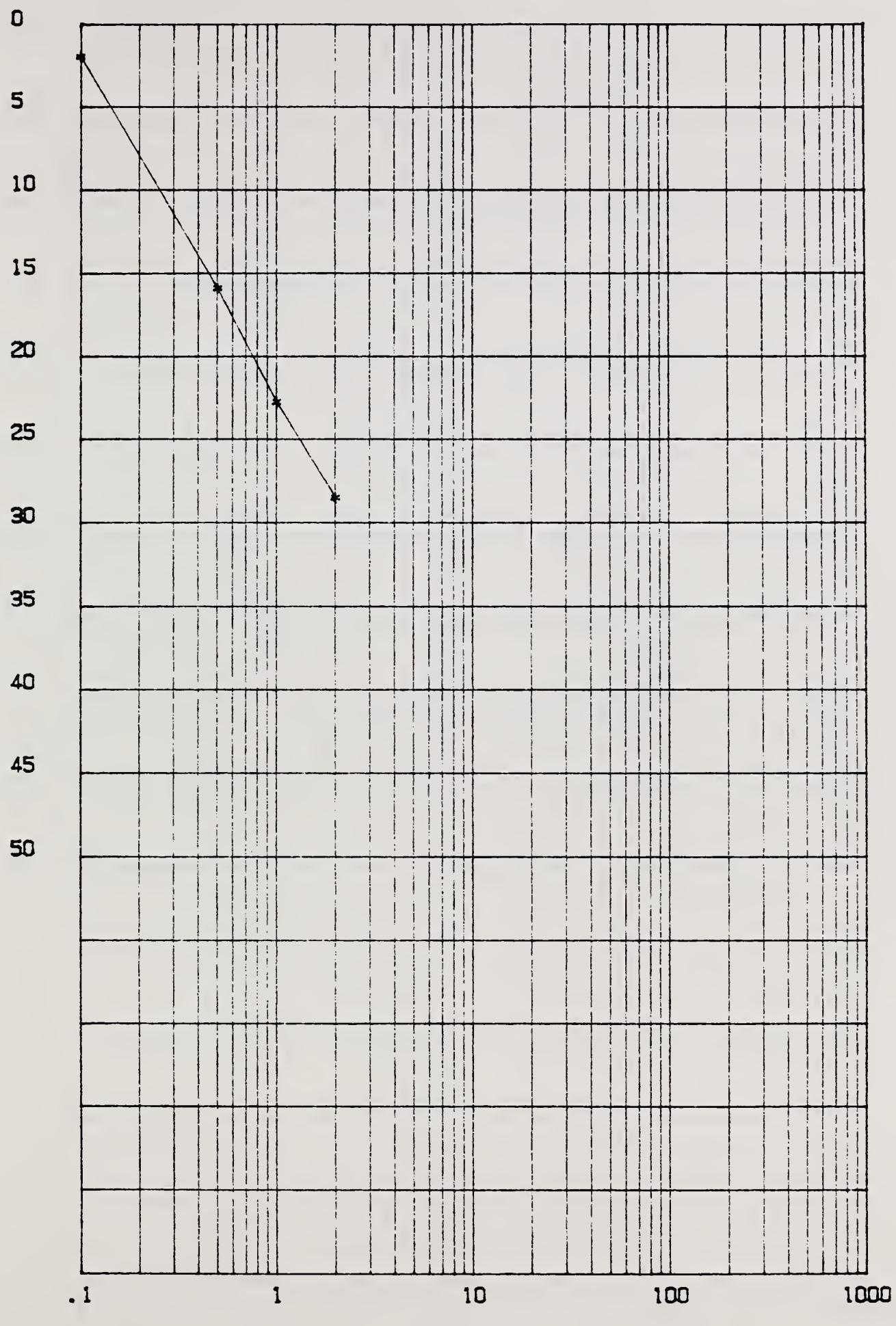
SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	89.98 g
INITIAL DRY WEIGHT:	79.62 g
INITIAL WATER CONTENT:	13 %
INITIAL WET DENSITY:	69.834 PCF
INITIAL DRY DENSITY:	61.793 PCF
SPECIFIC GRAVITY:	2.67
INITIAL VOID RATIO:	1.697
FINAL WET WEIGHT:	104.36 g
FINAL WATER CONTENT:	31 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.0196	1.6440	1.96
2.0	.50	.1592	1.2680	15.92
3.0	1.00	.2279	1.0820	22.79
4.0	2.00	.2854	.9270	28.54



Test 2

PERCENT CONSOLIDATION-LAB. SAMPLE,



Project: HEIDEN-WACO TX.

Field number:

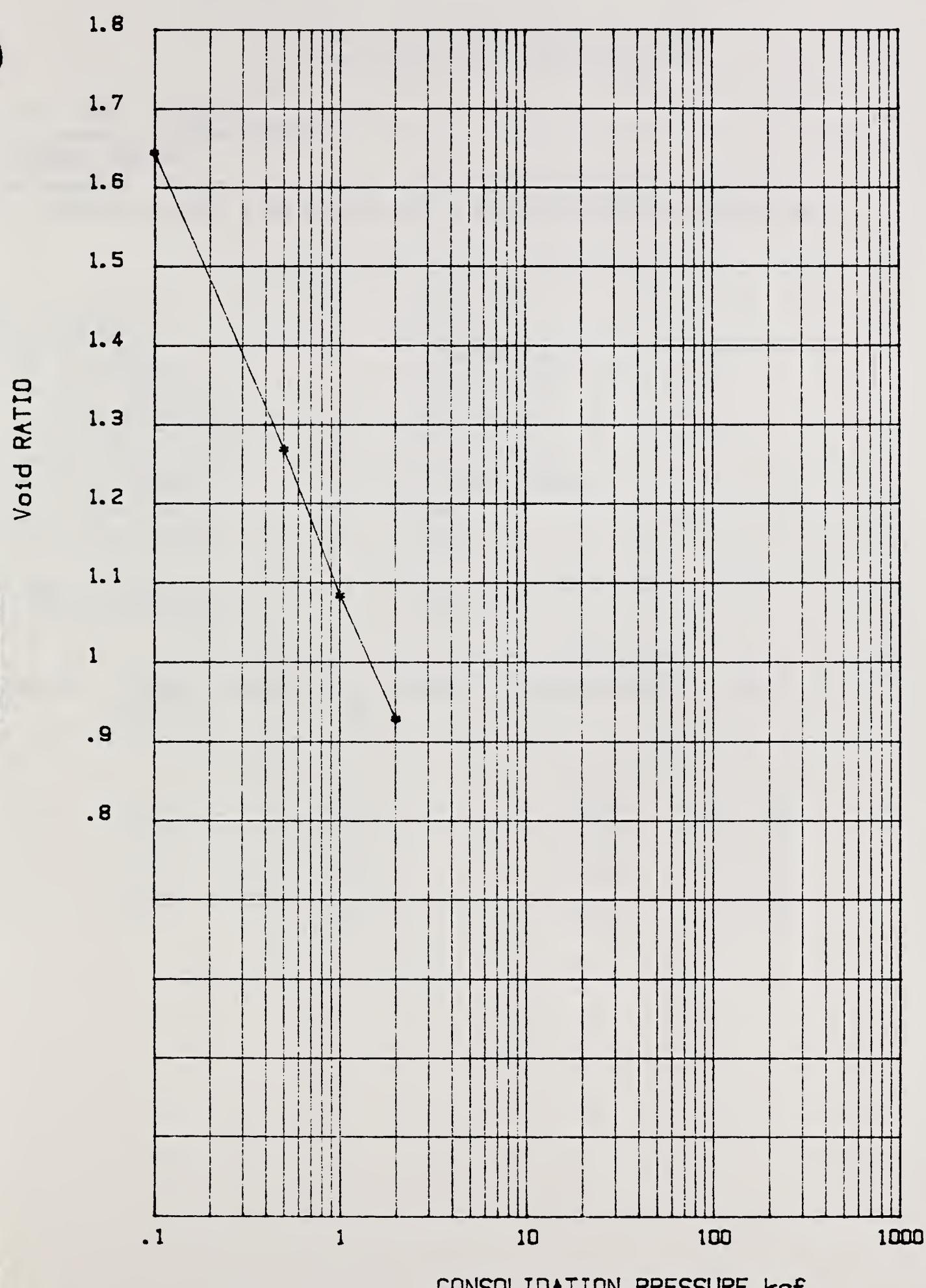
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C93

Sample depth: Feet



Test 3



Project: HEIDEN-WACO TX.

Field number:

USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C93

Sample depth: Feet



RESULTS OF CONSOLIDATION TEST

Project: WEPP SAMPLE

Field number: HIRSH-ORD NE.

LAB. NUMBER 88C94

Sample depth: Feet

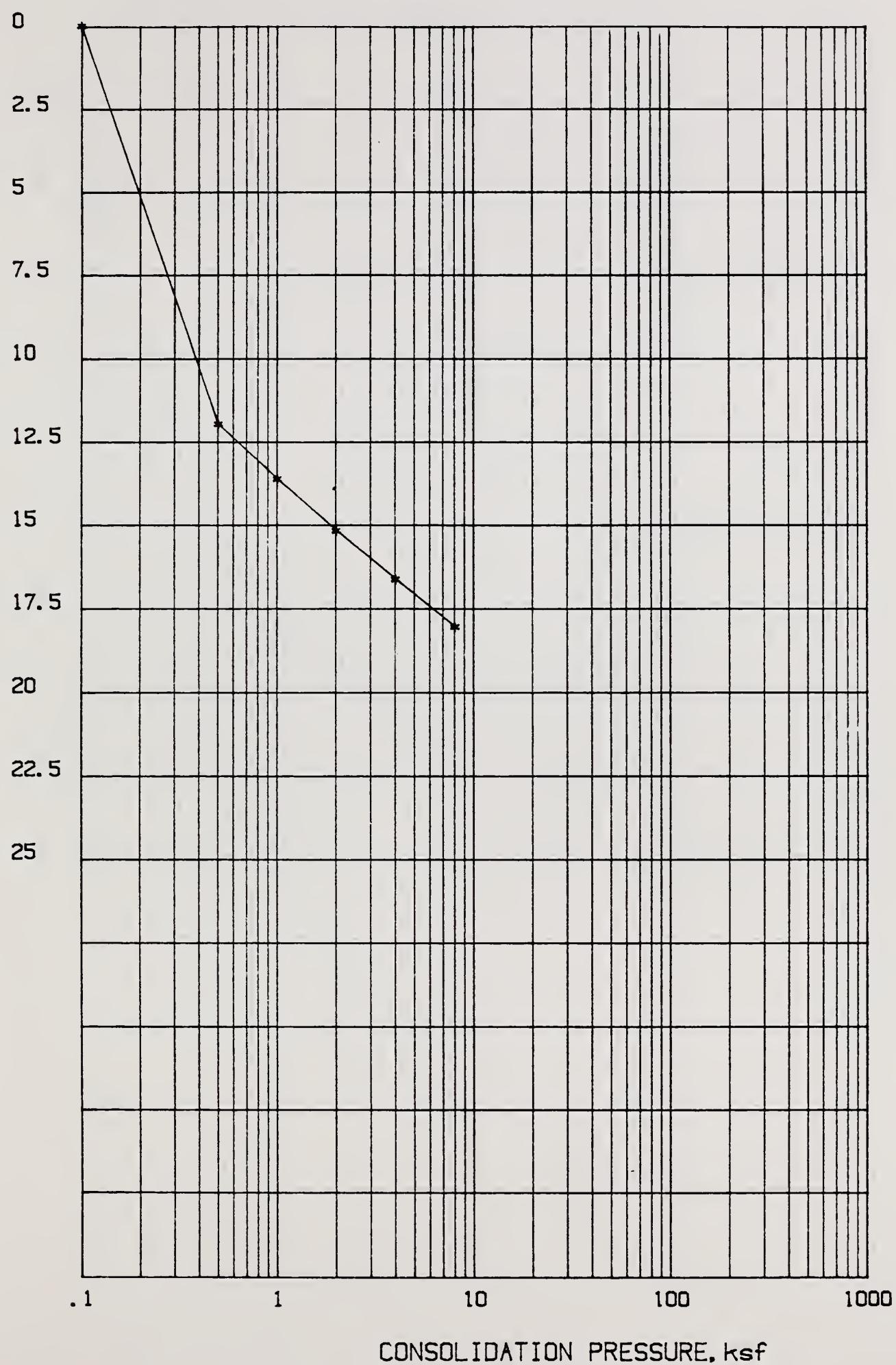
Sample description: COMPACTED TO 1.43 GM/CC NON-PLASTIC SM

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	118.08 g
INITIAL DRY WEIGHT:	111.69 g
INITIAL WATER CONTENT:	5.7 %
INITIAL WET DENSITY:	91.642 PCF
INITIAL DRY DENSITY:	86.683 PCF
SPECIFIC GRAVITY:	2.63
INITIAL VOID RATIO:	.894
FINAL WET WEIGHT:	132.44 g
FINAL WATER CONTENT:	18.5 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.0000	.8940	0.00
2.0	.50	.1198	.6670	11.98
3.0	1.00	.1363	.6350	13.63
4.0	2.00	.1519	.6060	15.19
5.0	4.00	.1665	.5780	16.65
6.0	8.00	.1808	.5510	18.08



PERCENT CONSOLIDATION-LAB. SAMPLE.



Project: WEPP SAMPLE

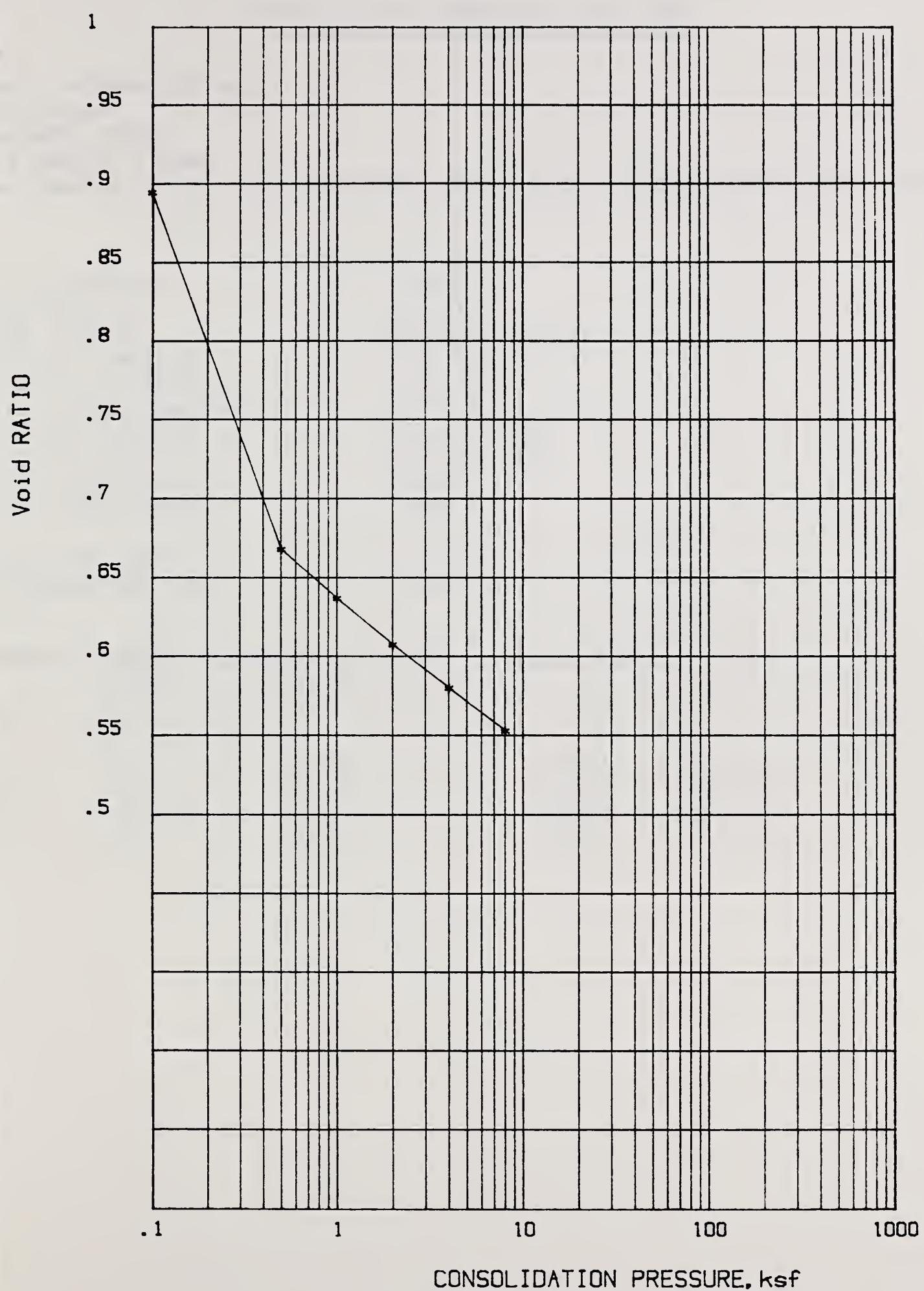
Field number: HIRSH-ORD NE.

USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C94

Sample depth: Feet





Project: WEPP SAMPLE
Field number: HIRSH-ORD NE.
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C94
Sample depth: Feet



Test

#2

RESULTS OF CONSOLIDATION TEST

=====

Project: HIRSH-ORD NE

Field number:

LAB. NUMBER 88C94

Sample depth: Feet

Sample description: COMPACTED TO 1.39 GMS/CC SATURATED AT START OF TEST

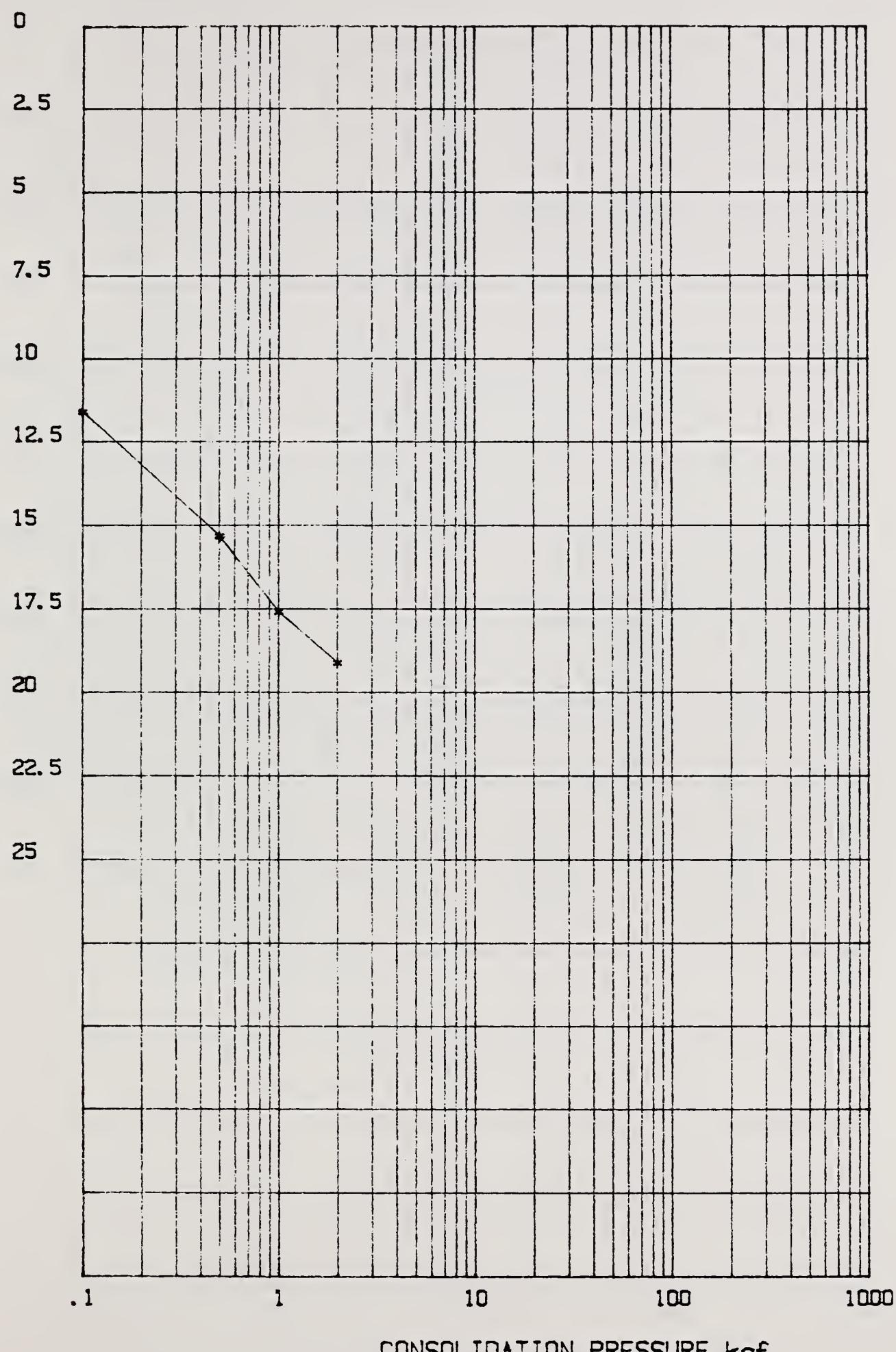
SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	117.6 g
INITIAL DRY WEIGHT:	111.8 g
INITIAL WATER CONTENT:	5.1 %
INITIAL WET DENSITY:	91.27 PCF
INITIAL DRY DENSITY:	86.768 PCF
SPECIFIC GRAVITY:	2.63
INITIAL VOID RATIO:	.892
FINAL WET WEIGHT:	132.61 g
FINAL WATER CONTENT:	18.6 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.1163	.6720	11.63
2.0	.50	.1536	.6010	15.36
3.0	1.00	.1763	.5580	17.63
4.0	2.00	.1916	.5290	19.16



Test No. 2

PERCENT CONSOLIDATION-LAB. SAMPLE.



Project: HIRSH-ORD NE

Field number:

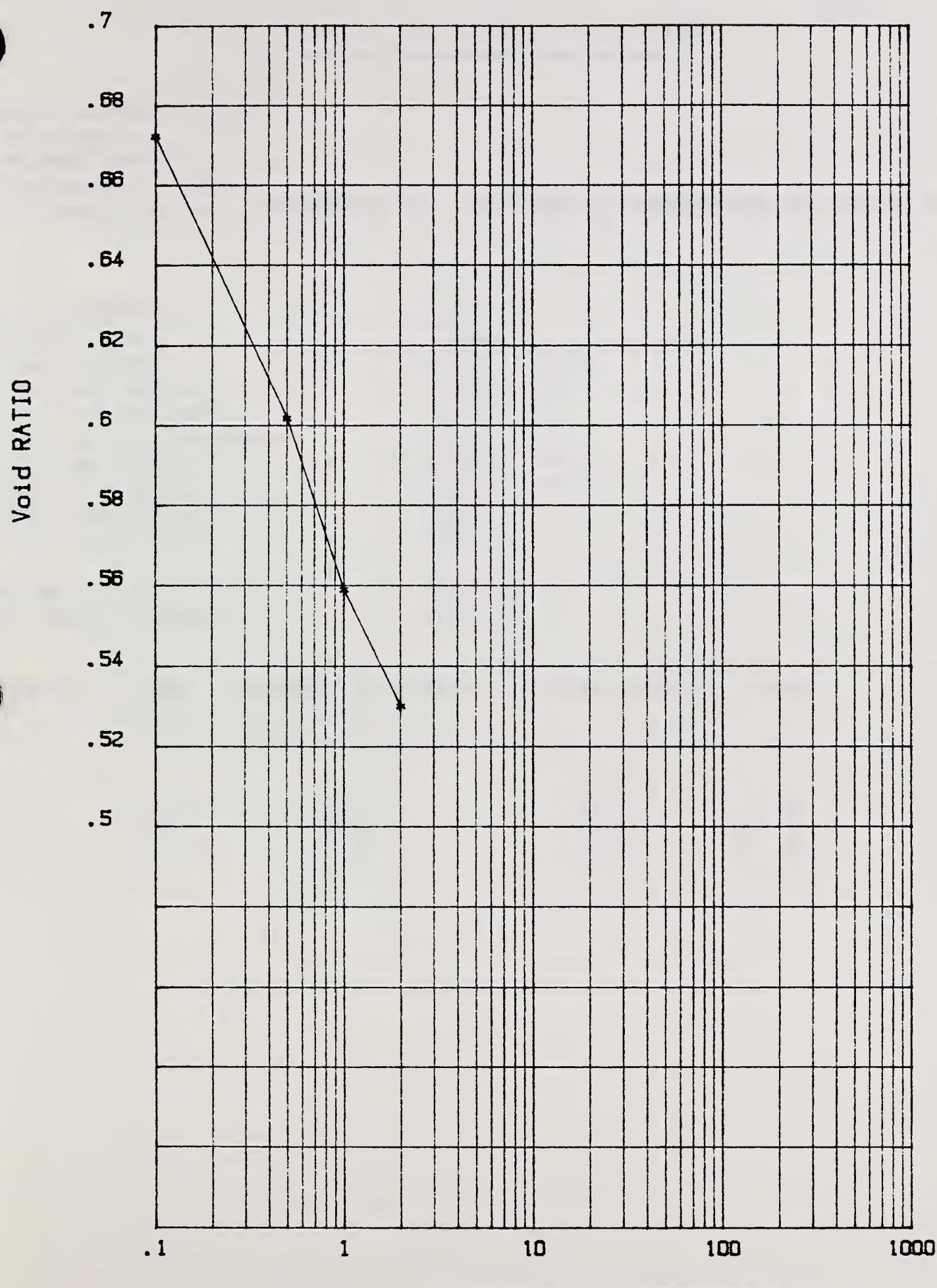
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C94

Sample depth: Feet



Test No. 2



Project: HIRSH-ORD NE

LAB. NUMBER 88C94

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



Test #3

RESULTS OF CONSOLIDATION TEST
=====

Project: HIRSH-ORD NE.

Field number:

LAB. NUMBER 88C94

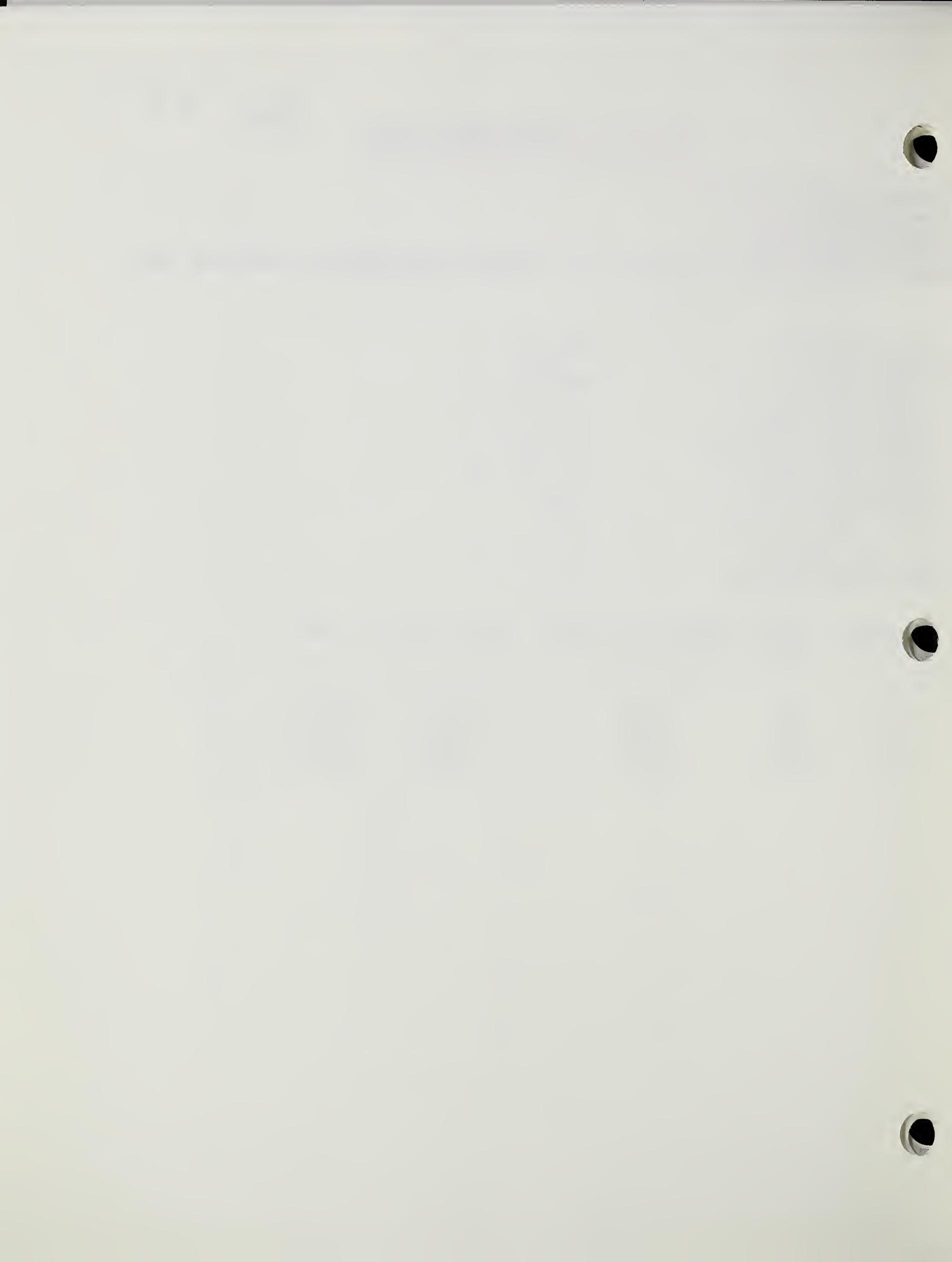
Sample depth: Feet

Sample description: COMPACTED TO 1.39 GMS/CC SATURATED AT START OF TEST

SAMPLE DIAMETER: 2.5 ins
SAMPLE HEIGHT: 1 ins
INITIAL VOLUME: 80.439 cm³
INITIAL WET WEIGHT: 115.88 g
INITIAL DRY WEIGHT: 111.81 g
INITIAL WATER CONTENT: 3.6 %
INITIAL WET DENSITY: 89.935 PCF
INITIAL DRY DENSITY: 86.776 PCF
SPECIFIC GRAVITY: 2.63
INITIAL VOID RATIO: .892

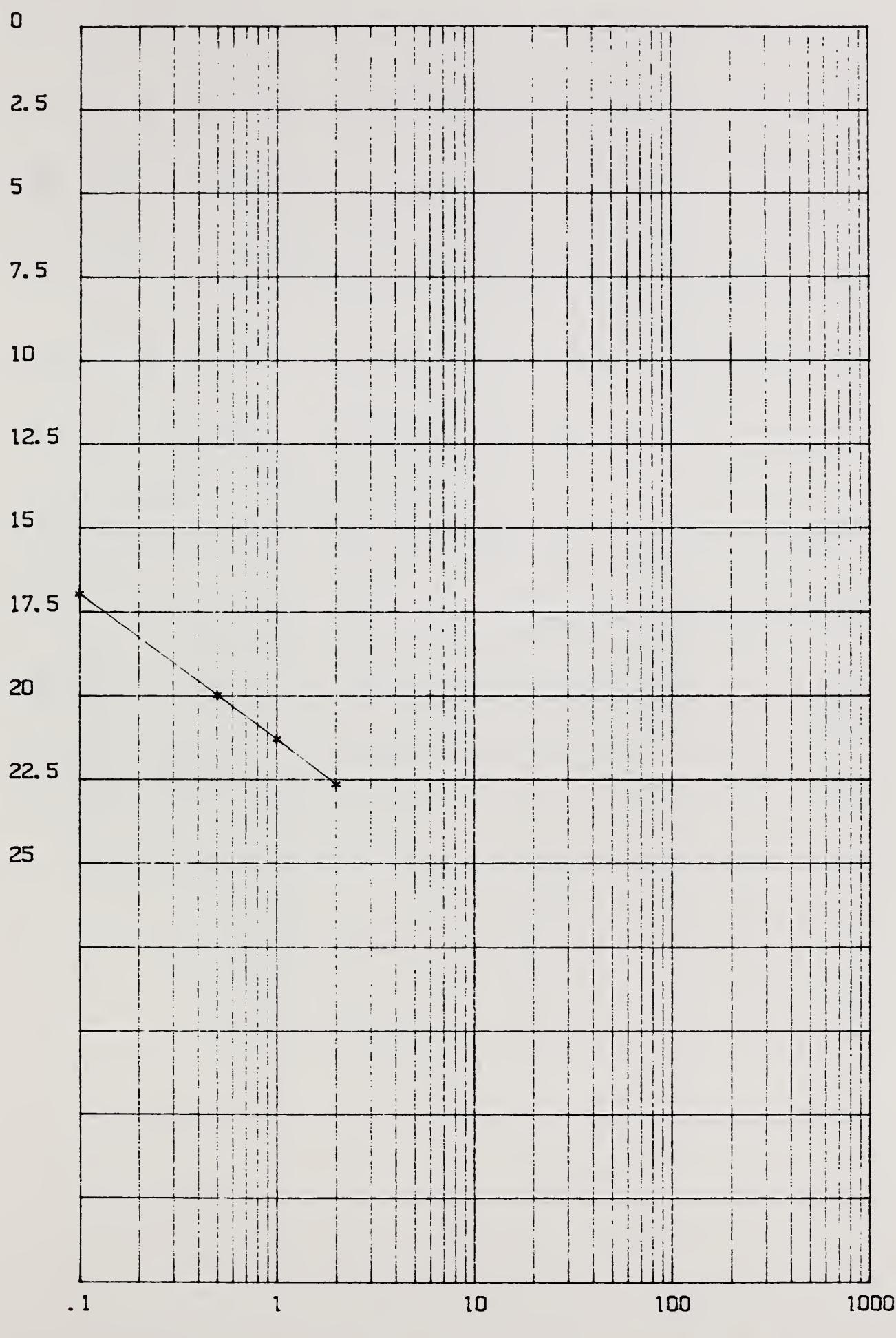
FINAL WET WEIGHT: 135.16 g
FINAL WATER CONTENT: 20.8 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.1700	.5700	17.00
2.0	.50	.2003	.5130	20.03
3.0	1.00	.2135	.4880	21.35
4.0	2.00	.2270	.4620	22.70



Test No. 3

PERCENT CONSOLIDATION-LAB. SAMPLE.



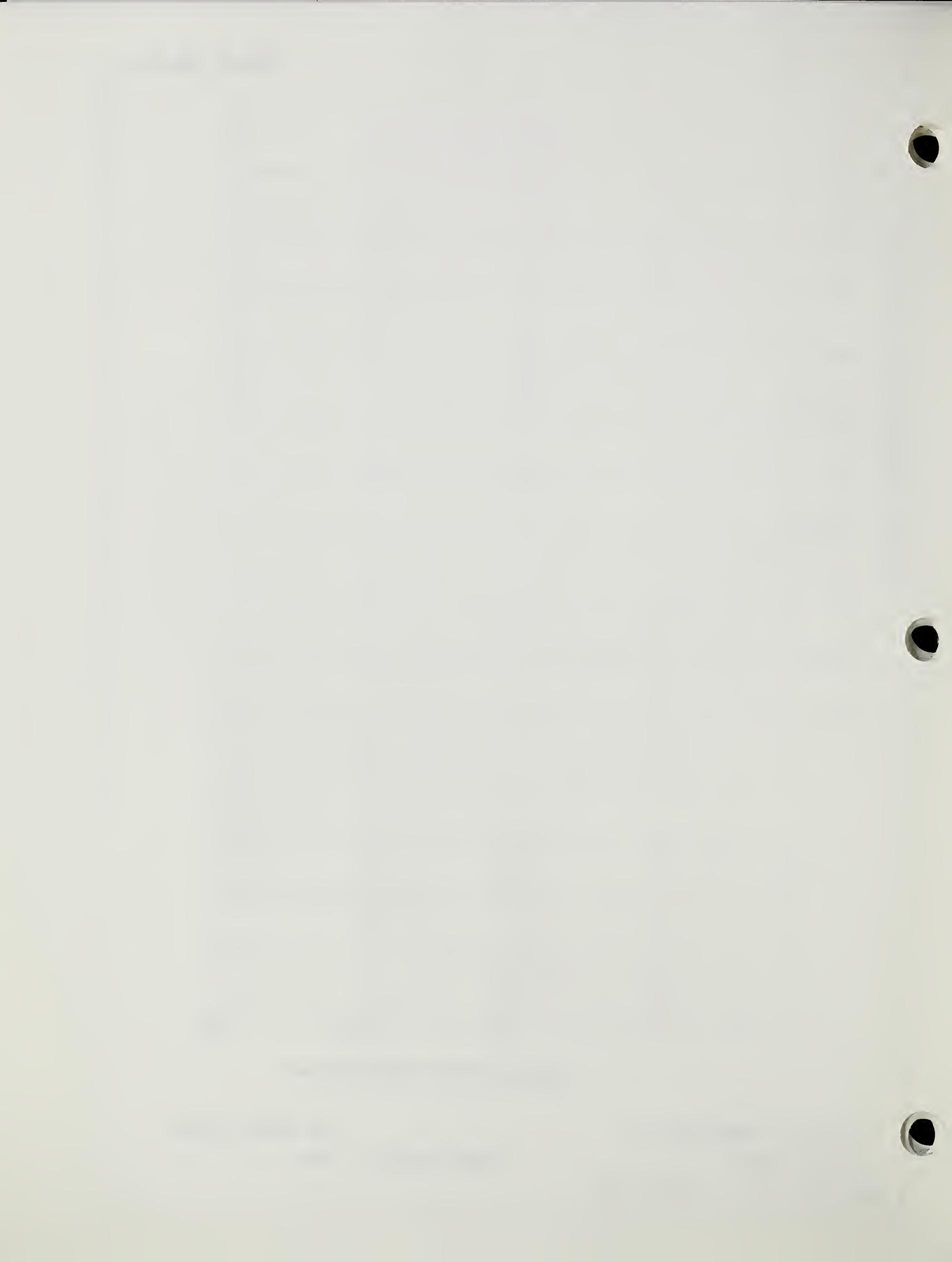
Project: HIRSH-ORD NE.

Field number:

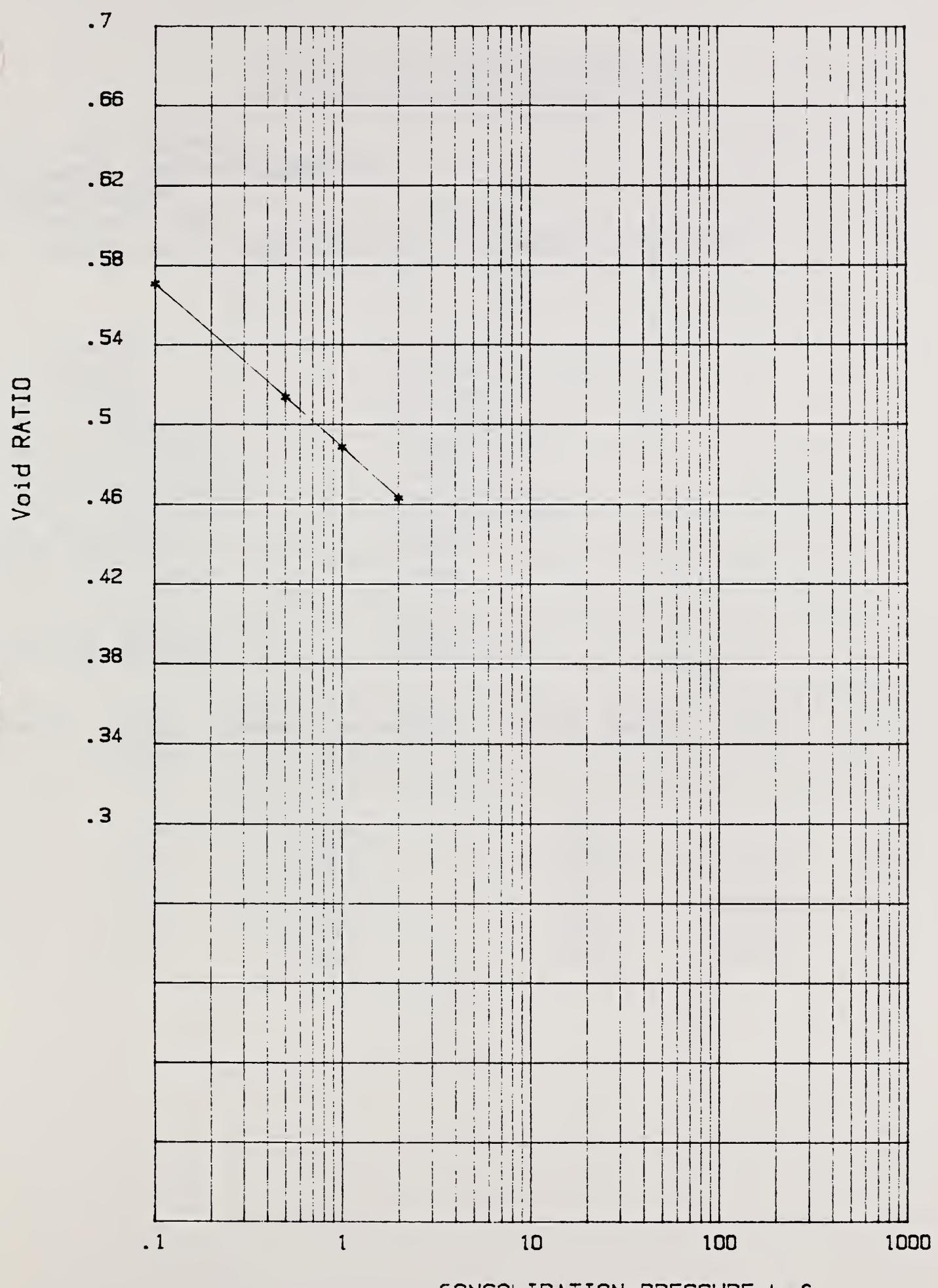
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C94

Sample depth: Feet



Test No. 3



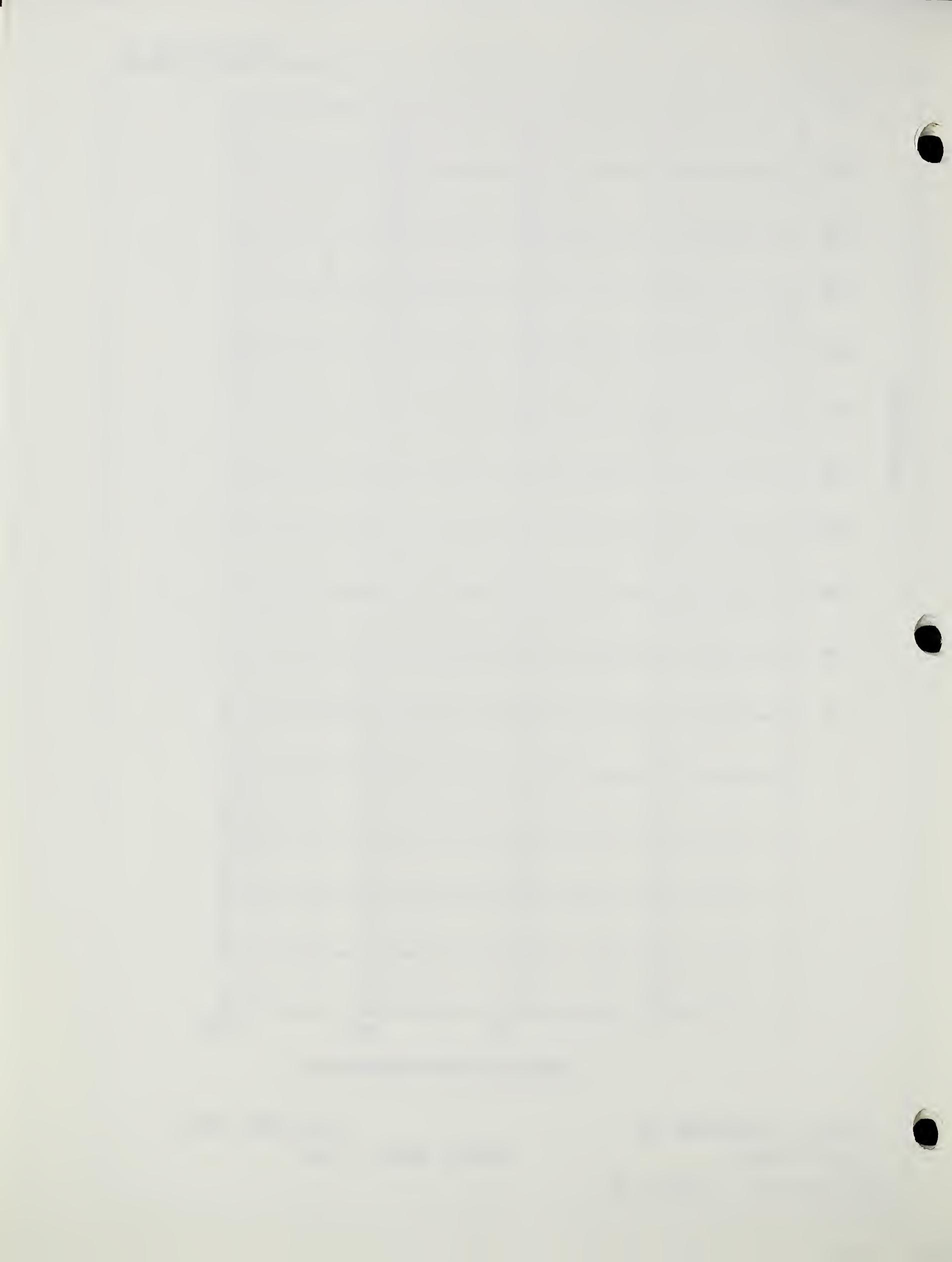
Project: HIRSH-ORD NE.

Field number:

USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C94

Sample depth: Feet



RESULTS OF CONSOLIDATION TEST

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Project: WEPP SAMPLE

Field number: KEITH-ALBION WY.

LAB. NUMBER 88C95

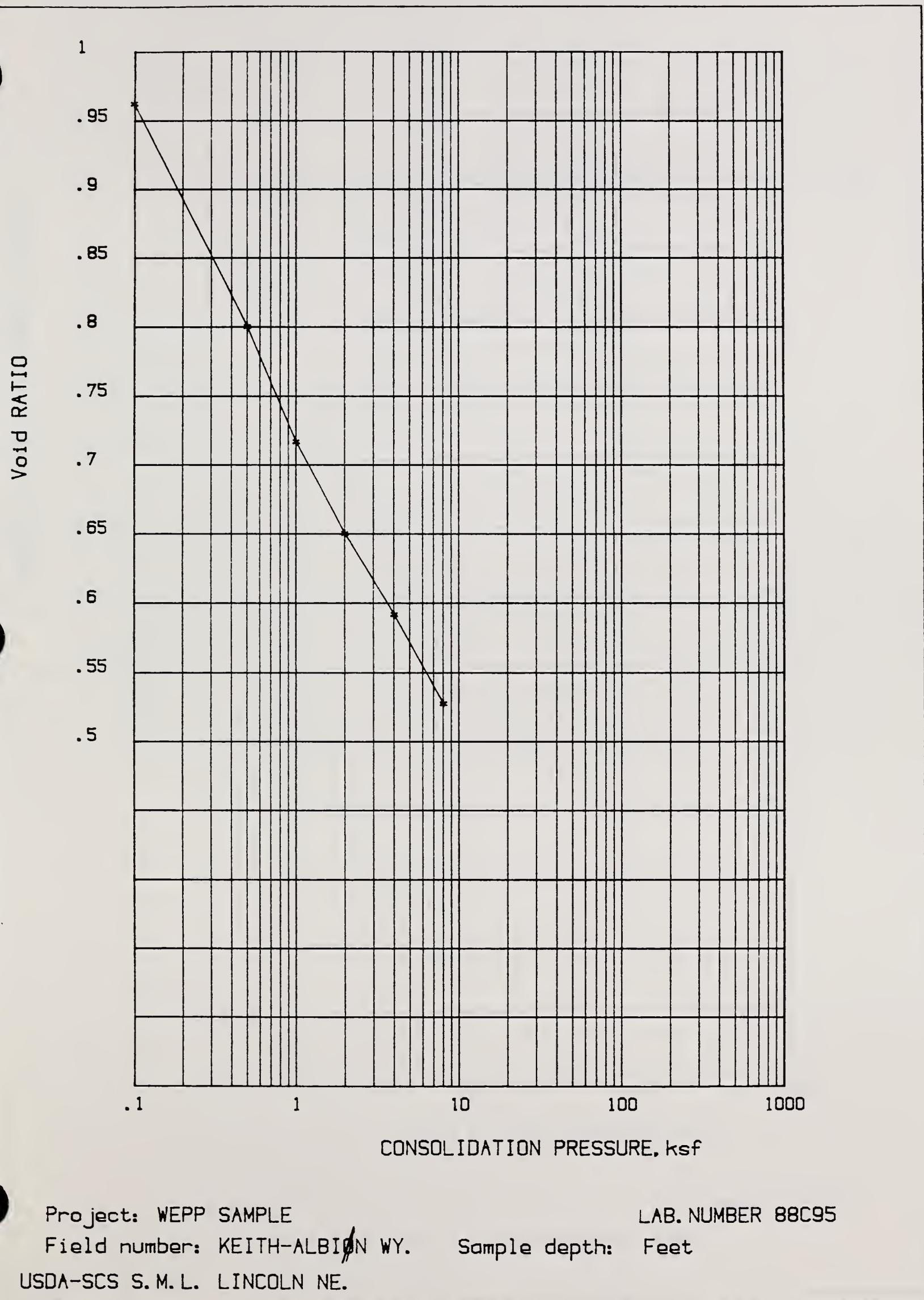
Sample depth: Feet

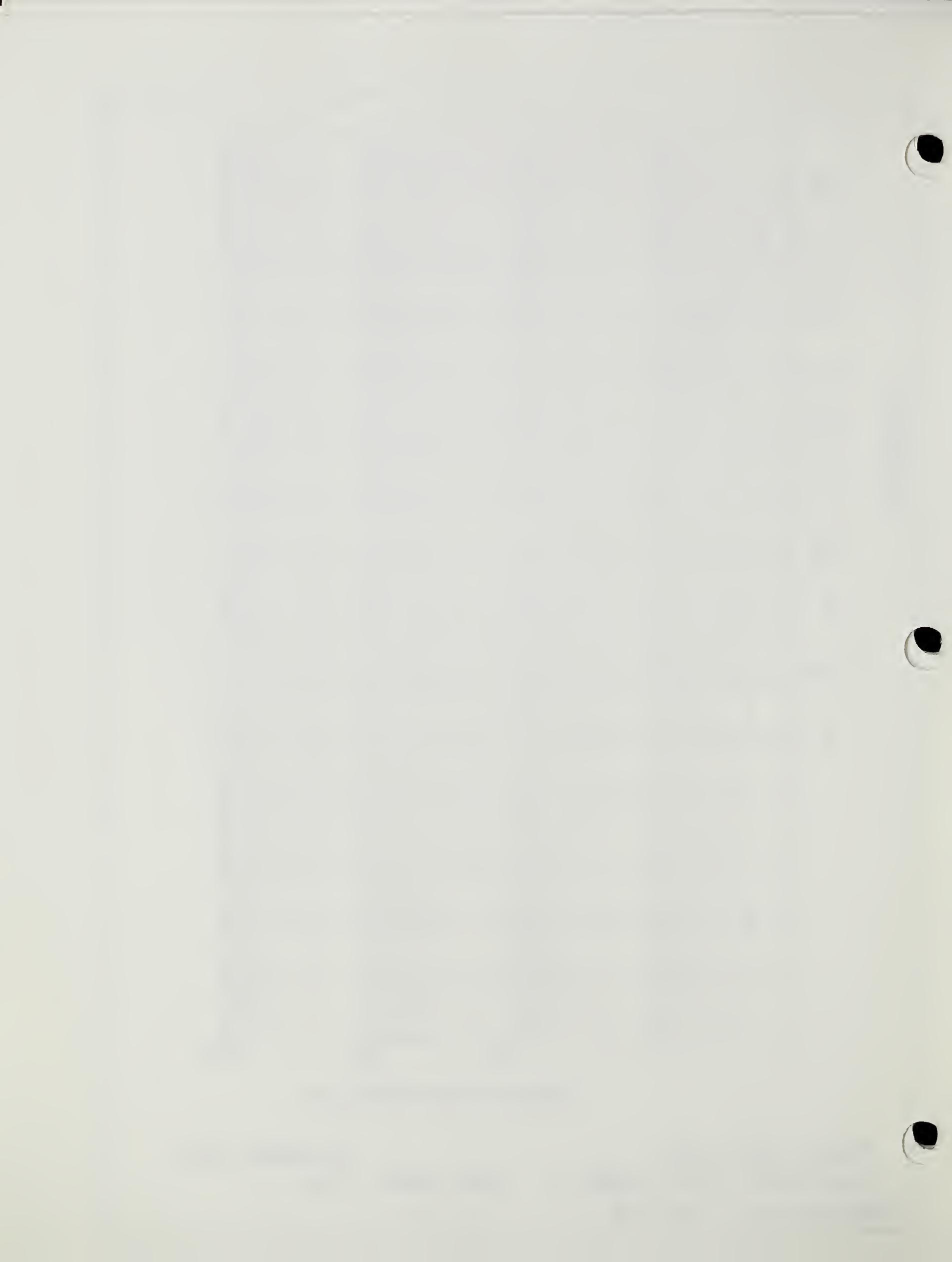
Sample description: COMPACTED TO 1.32 GM/CC LL=32 PI=13

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	121.43 g
INITIAL DRY WEIGHT:	106.18 g
INITIAL WATER CONTENT:	14.3 %
INITIAL WET DENSITY:	94.242 PCF
INITIAL DRY DENSITY:	82.407 PCF
SPECIFIC GRAVITY:	2.59
INITIAL VOID RATIO:	.962
FINAL WET WEIGHT:	128.11 g
FINAL WATER CONTENT:	20.6 %

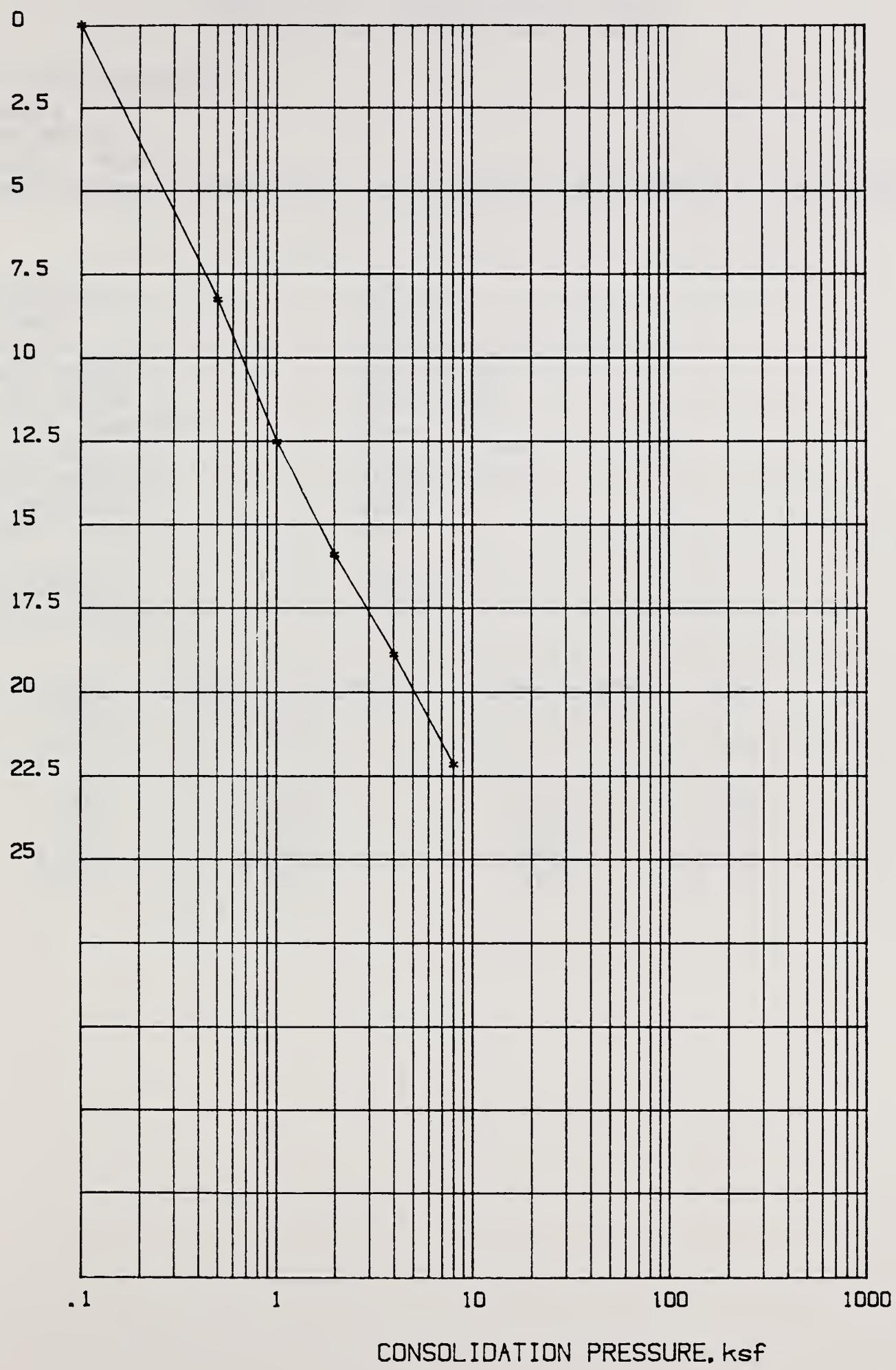
INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.0000	.9620	0.00
2.0	.50	.0827	.7990	8.27
3.0	1.00	.1253	.7160	12.53
4.0	2.00	.1593	.6490	15.93
5.0	4.00	.1891	.5910	18.91
6.0	8.00	.2220	.5260	22.20







PERCENT CONSOLIDATION-LAB. SAMPLE.



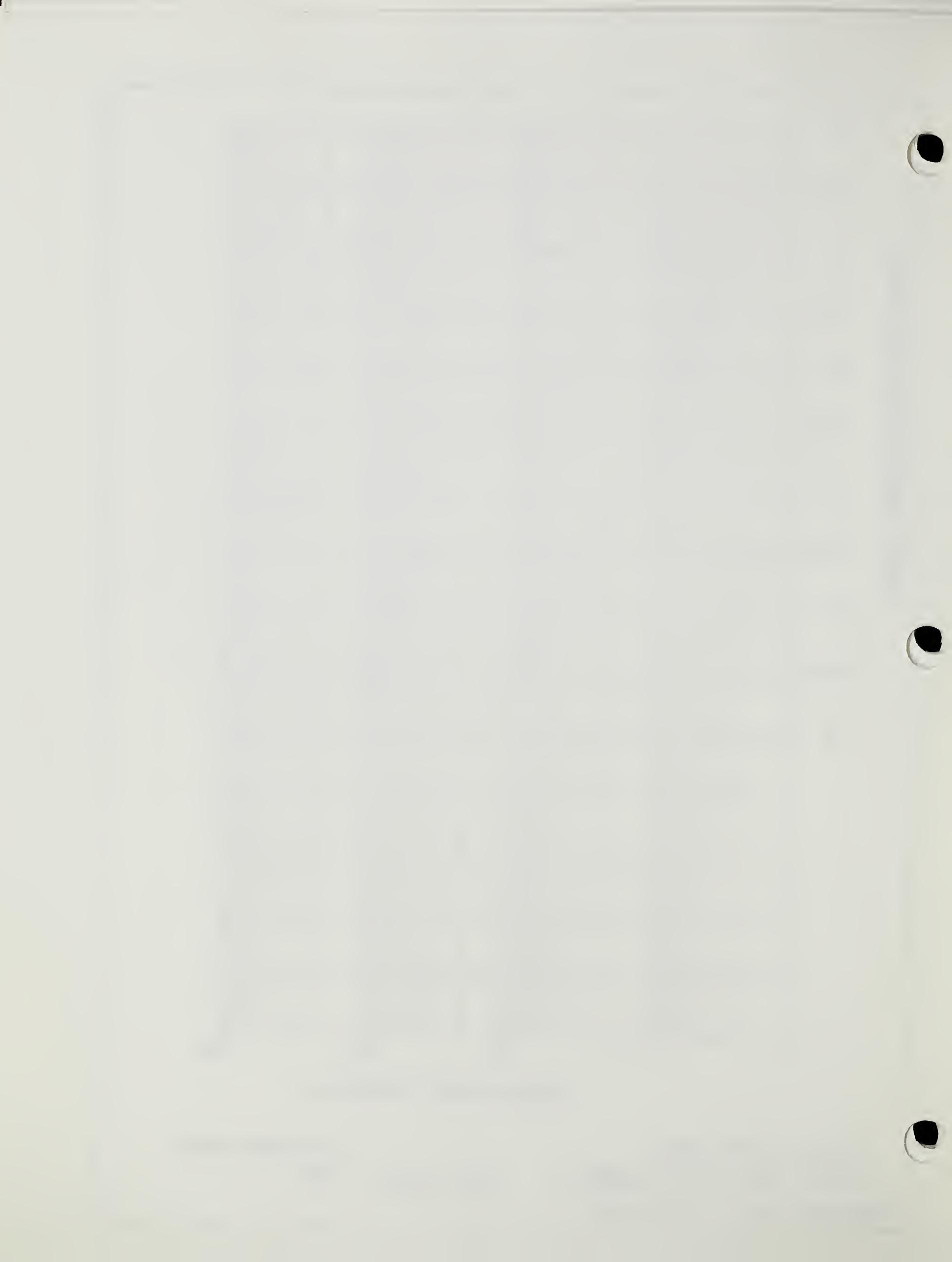
Project: WEPP SAMPLE

Field number: KEITH-ALBION WY.

USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C95

Sample depth: Feet



Test 2

RESULTS OF CONSOLIDATION TEST

=====

Project: KIETH-ALBIN WY

Field number:

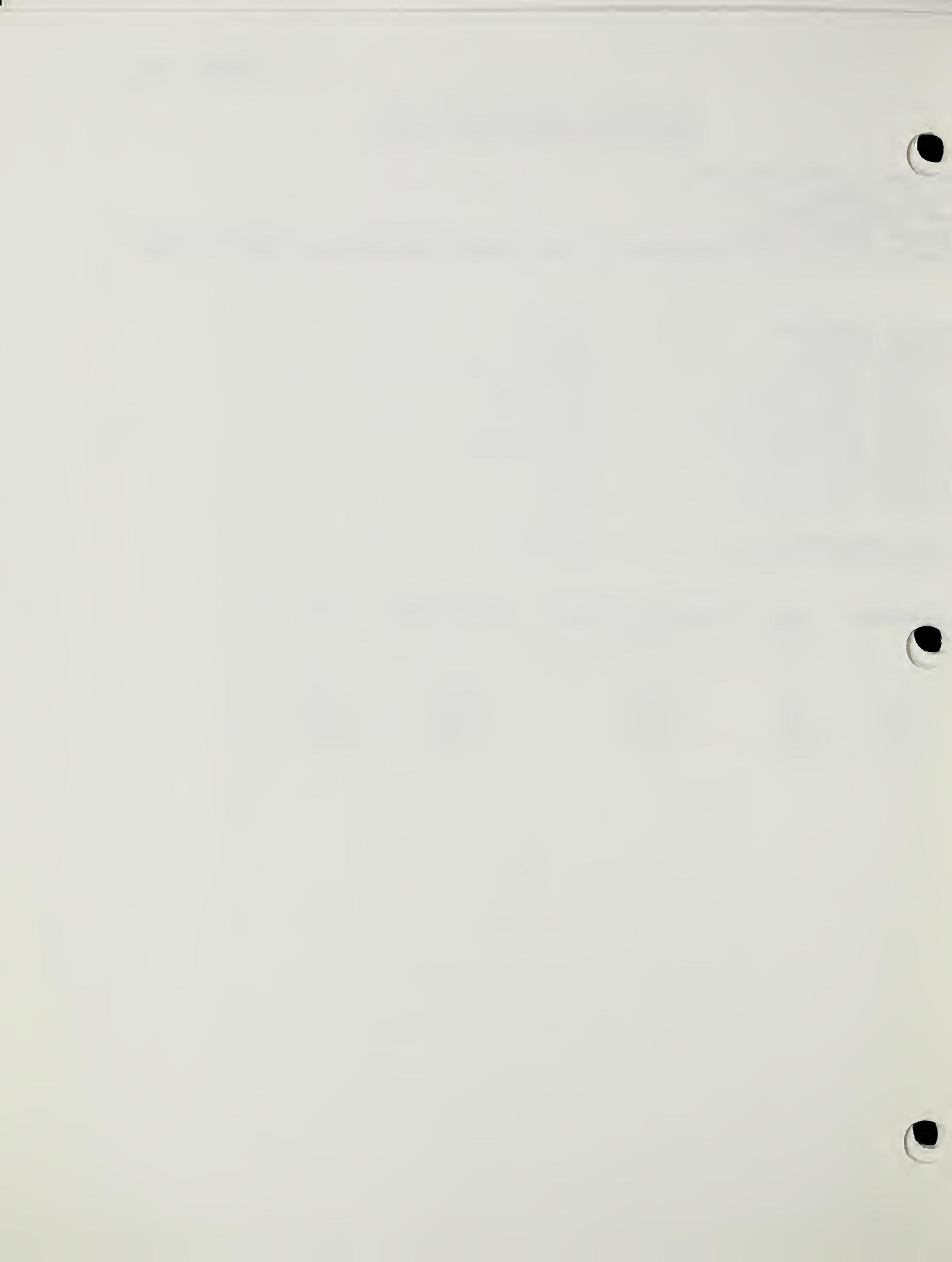
LAB. NUMBER 88C95

Sample depth: Feet

Sample description: COMPACTED TO 1.32 GMS/CC SATURATED AT START OF TEST

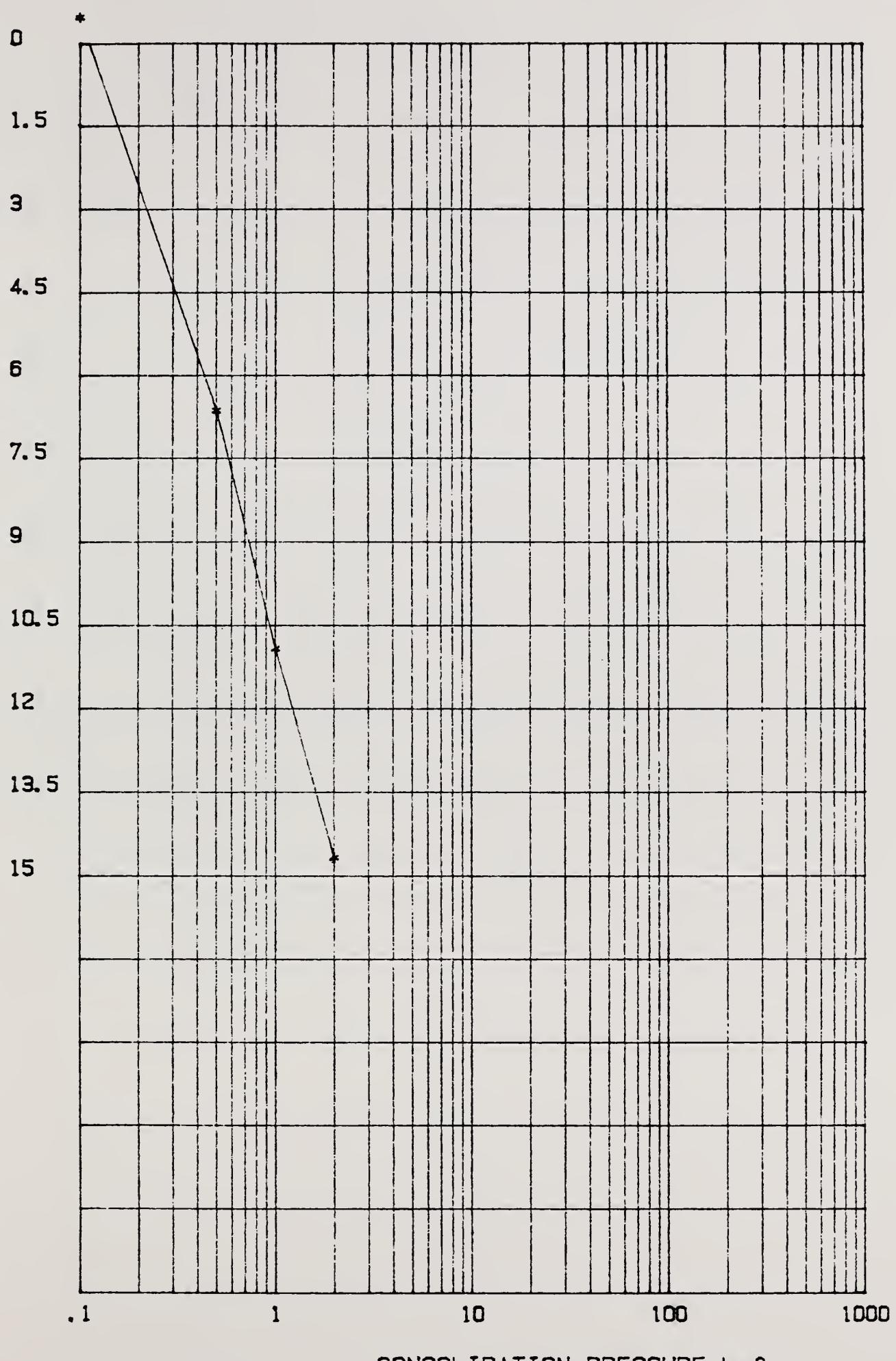
SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	125.78 g
INITIAL DRY WEIGHT:	106.17 g
INITIAL WATER CONTENT:	18.4 %
INITIAL WET DENSITY:	97.618 PCF
INITIAL DRY DENSITY:	82.399 PCF
SPECIFIC GRAVITY:	2.59
INITIAL VOID RATIO:	.962
FINAL WET WEIGHT:	135.88 g
FINAL WATER CONTENT:	27.9 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	-.0048	.9710	-.48
2.0	.50	.0665	.8310	6.65
3.0	1.00	.1094	.7470	10.94
4.0	2.00	.1470	.6730	14.70



Test 2

PERCENT CONSOLIDATION-LAB. SAMPLE.



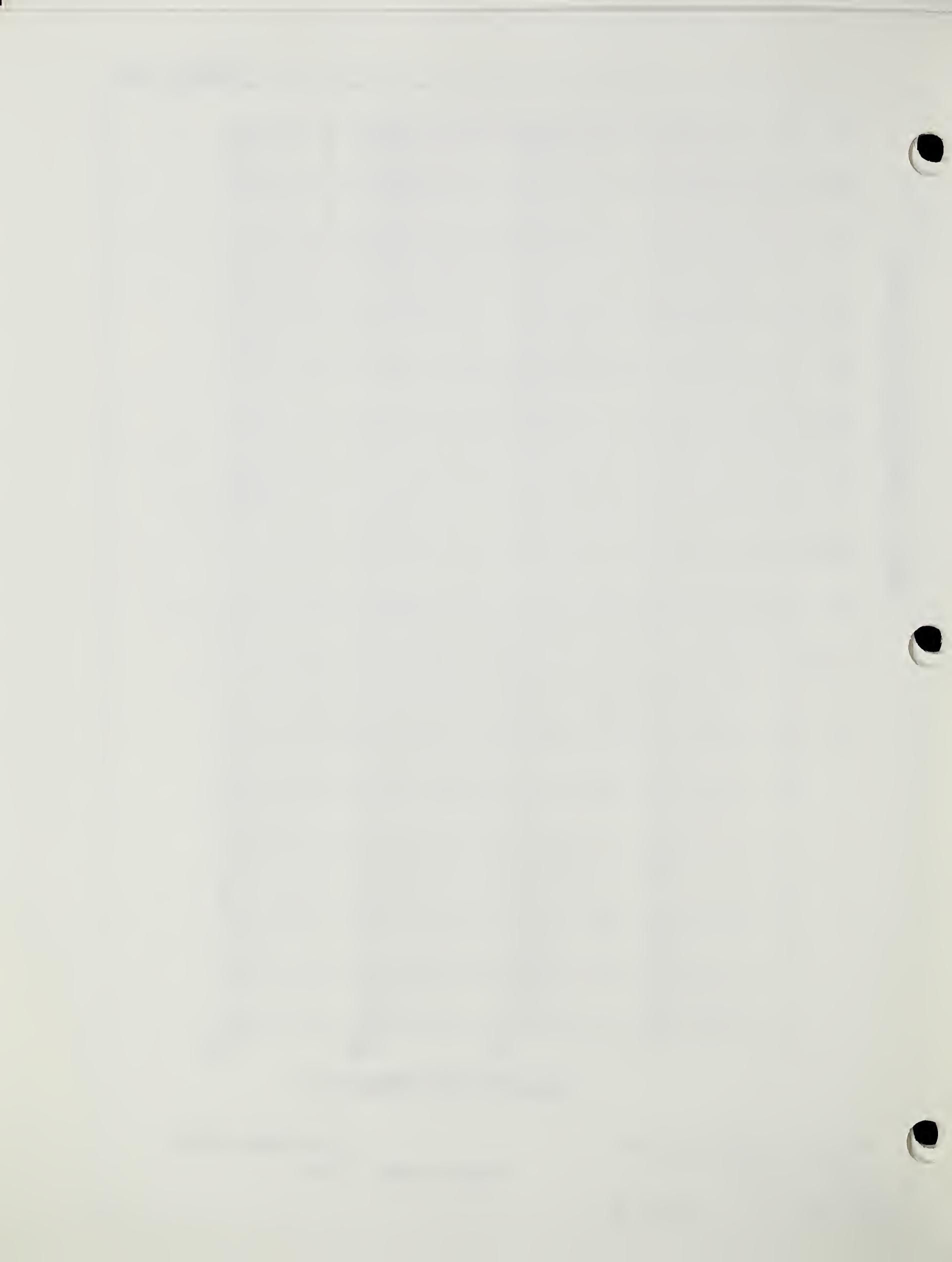
Project: KIETH-ALBIN WY

Field number:

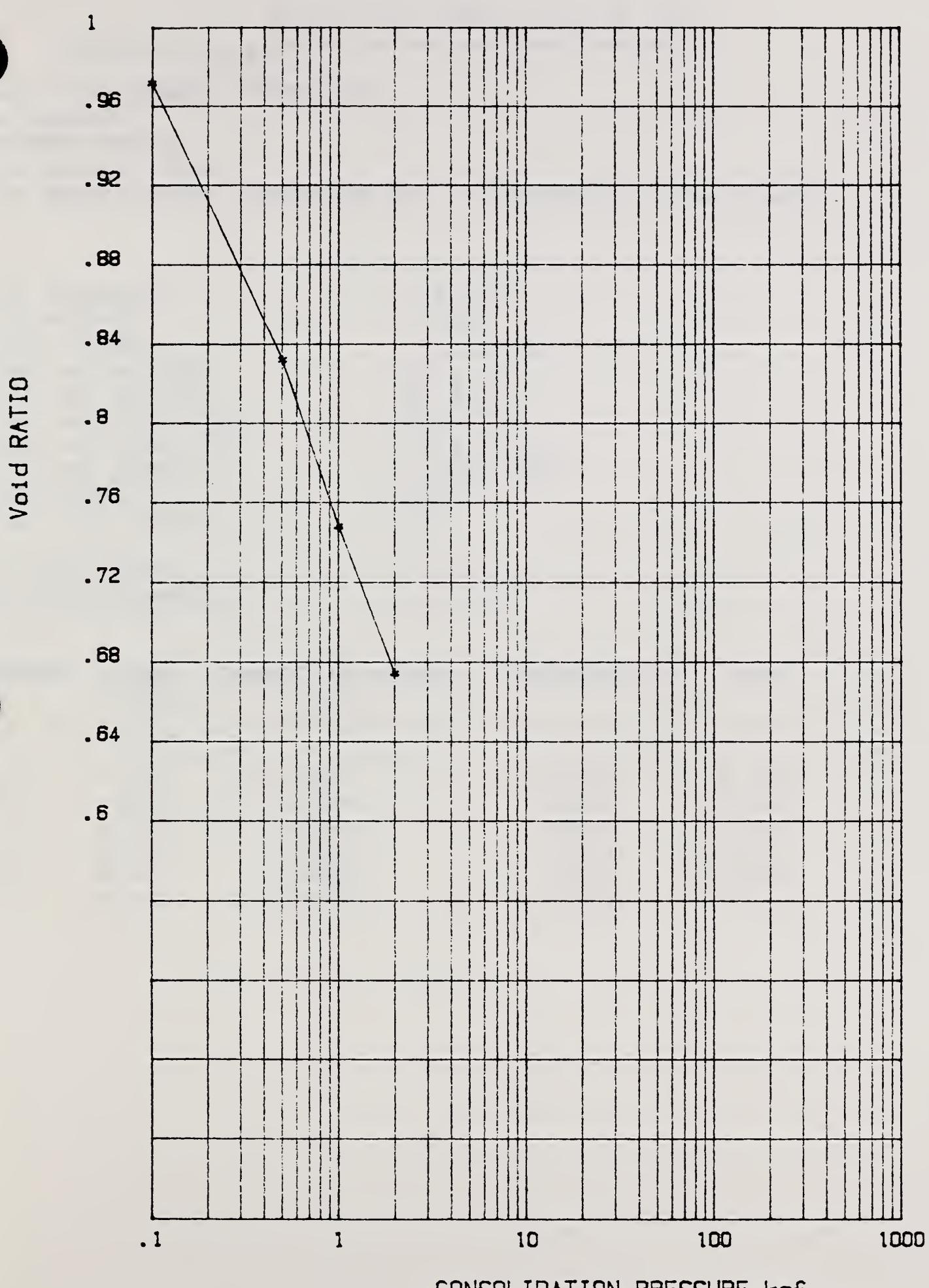
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C95

Sample depth: Feet

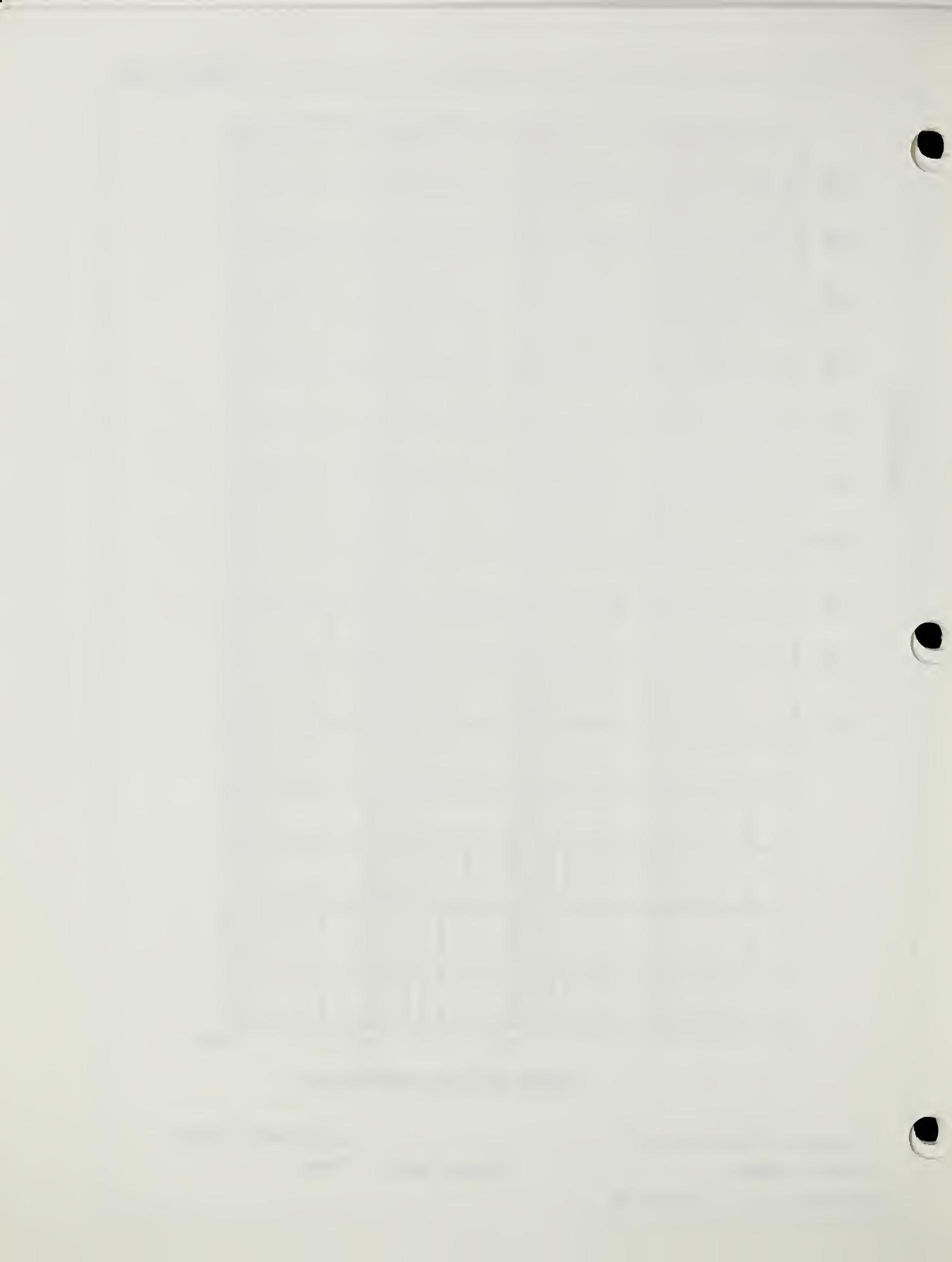


Test 2



Project: KIETH-ALBIN WY
Field number:
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C95
Sample depth: Feet



RESULTS OF CONSOLIDATION TEST

WEPP Sample

Project: LOS BANOS--FRESNO CA.

Field number:

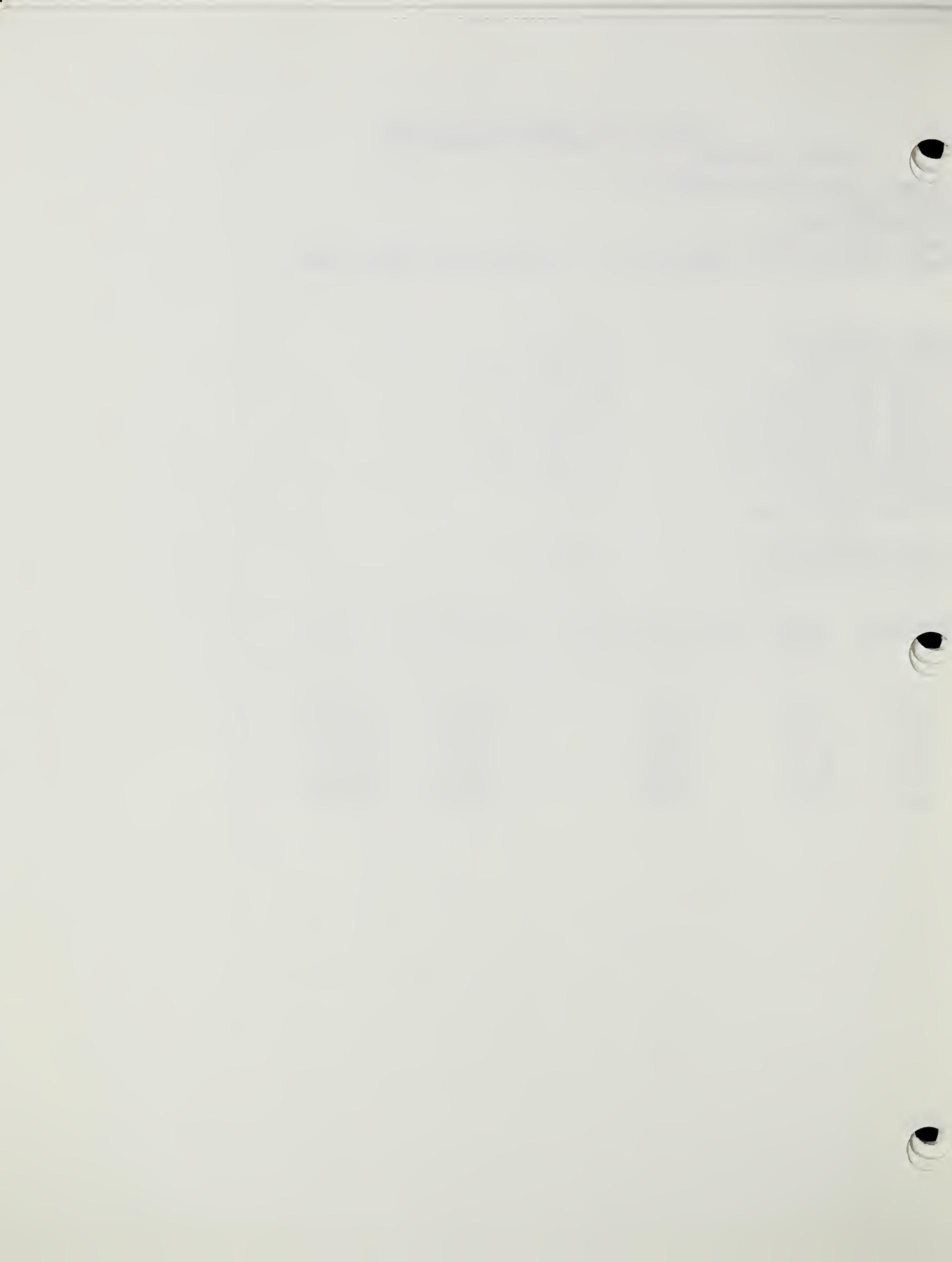
LAB. NUMBER 88C96

Sample depth: Feet

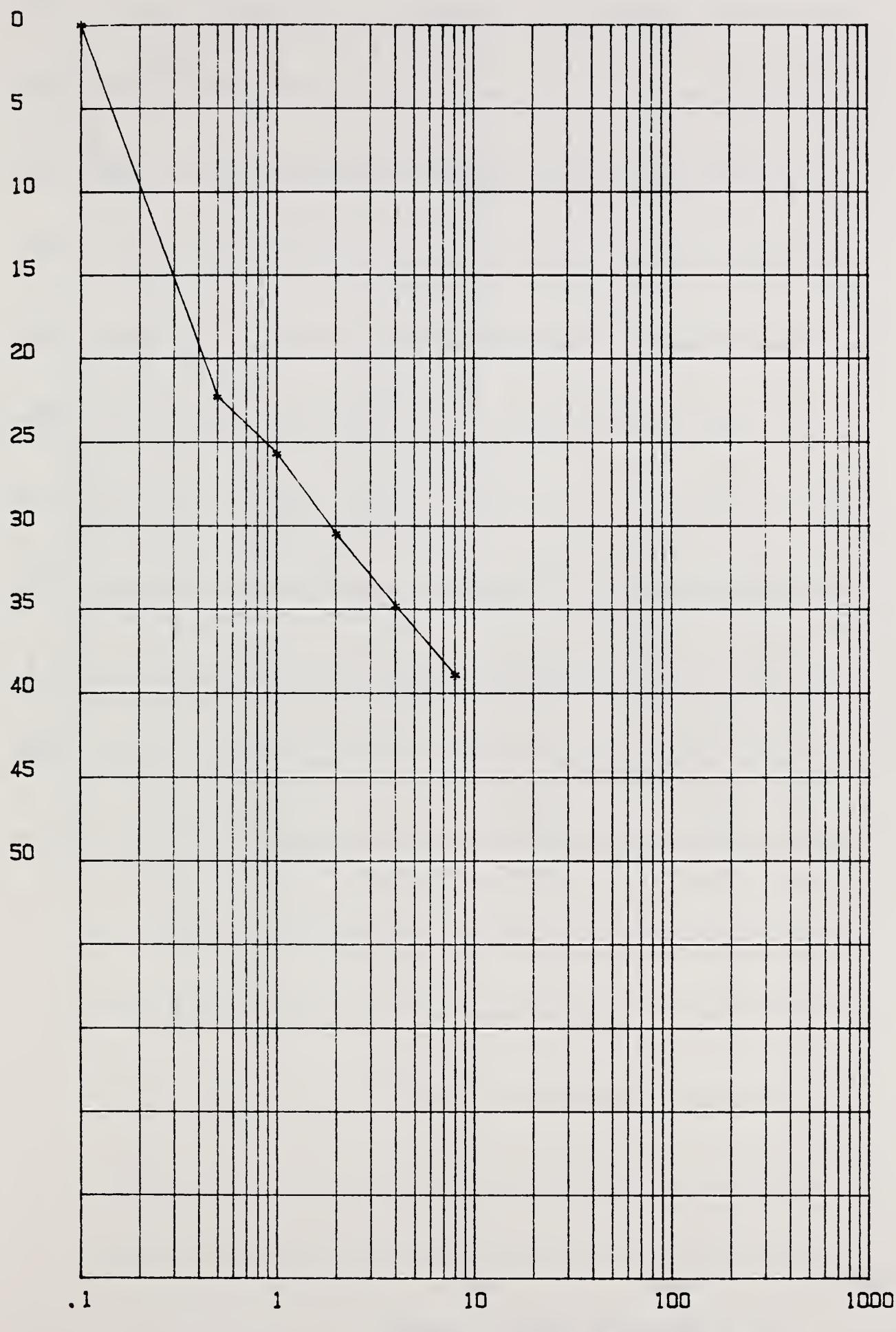
Sample description: COMPACTED TO 1.0 GMS/CC CL LL=46 PI=25

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	92.1 g
INITIAL DRY WEIGHT:	80.43 g
INITIAL WATER CONTENT:	14.5 %
INITIAL WET DENSITY:	71.479 PCF
INITIAL DRY DENSITY:	62.422 PCF
SPECIFIC GRAVITY:	2.61
INITIAL VOID RATIO:	1.61
FINAL WET WEIGHT:	102.46 g
FINAL WATER CONTENT:	27.3 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	0.0000	1.6100	0.00
2.0	.50	.2234	1.0270	22.34
3.0	1.00	.2571	.9390	25.71
4.0	2.00	.3053	.8130	30.53
5.0	4.00	.3486	.7000	34.86
6.0	8.00	.3900	.5920	39.00



PERCENT CONSOLIDATION-LAB. SAMPLE.



Project: LOS BANOS--FRESNO CA.

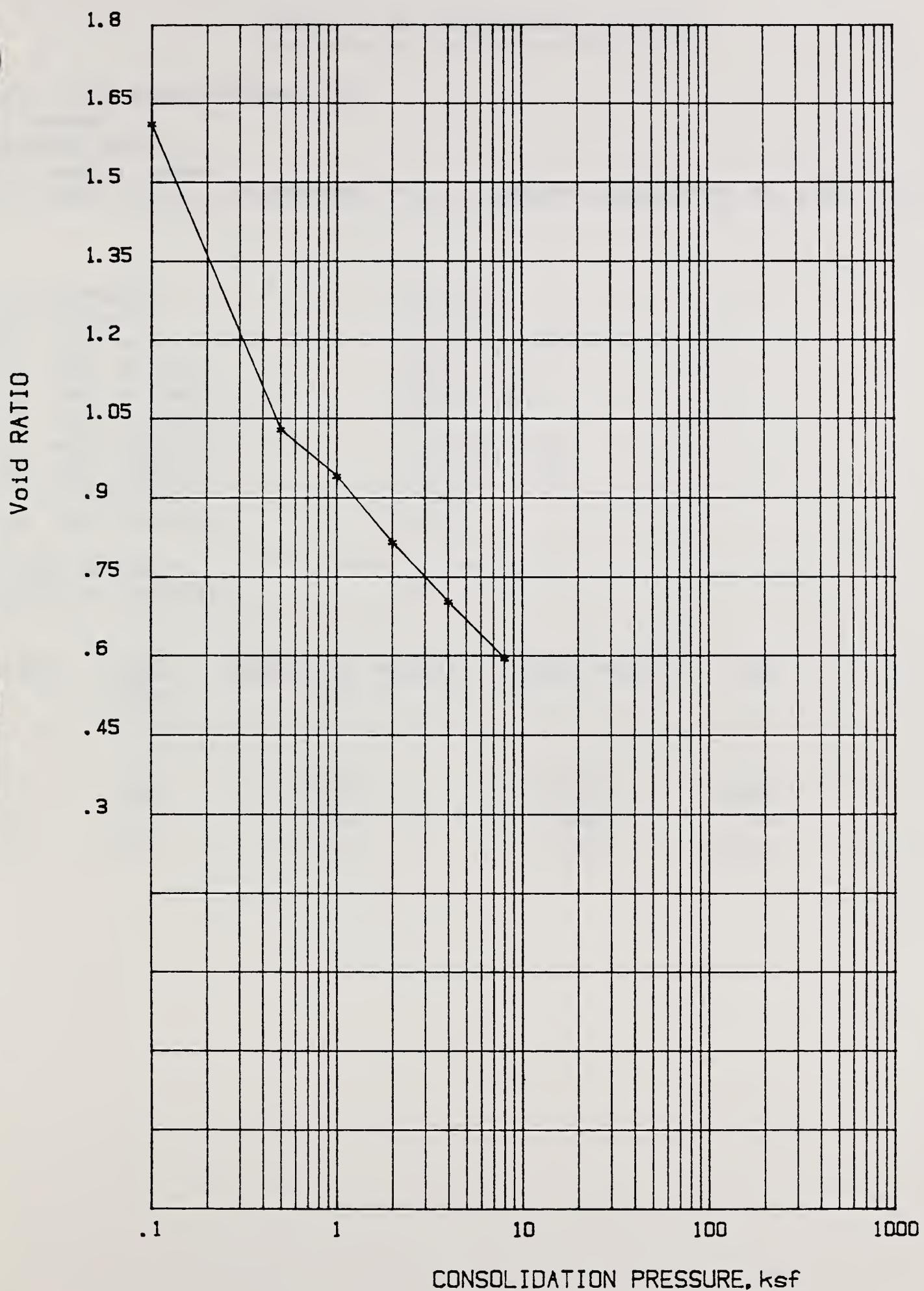
LAB. NUMBER 88C96

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.





Project: LOS BANOS--FRESNO CA.
Field number:
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C96
Sample depth: Feet



RESULTS OF CONSOLIDATION TEST

=====

Project: LOS BANOS-FRESNO CA

Field number:

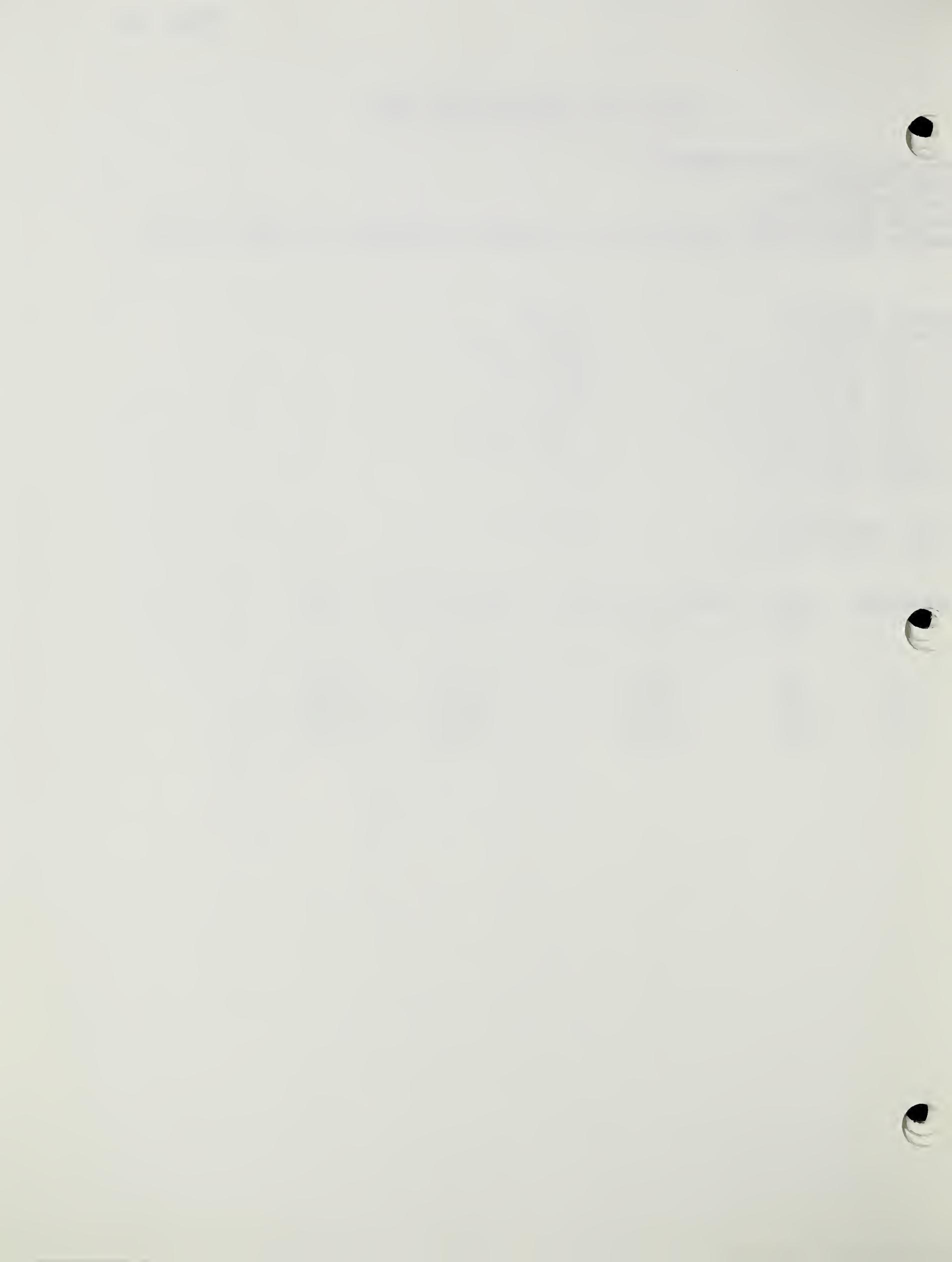
LAB. NUMBER 88C96

Sample depth: Feet

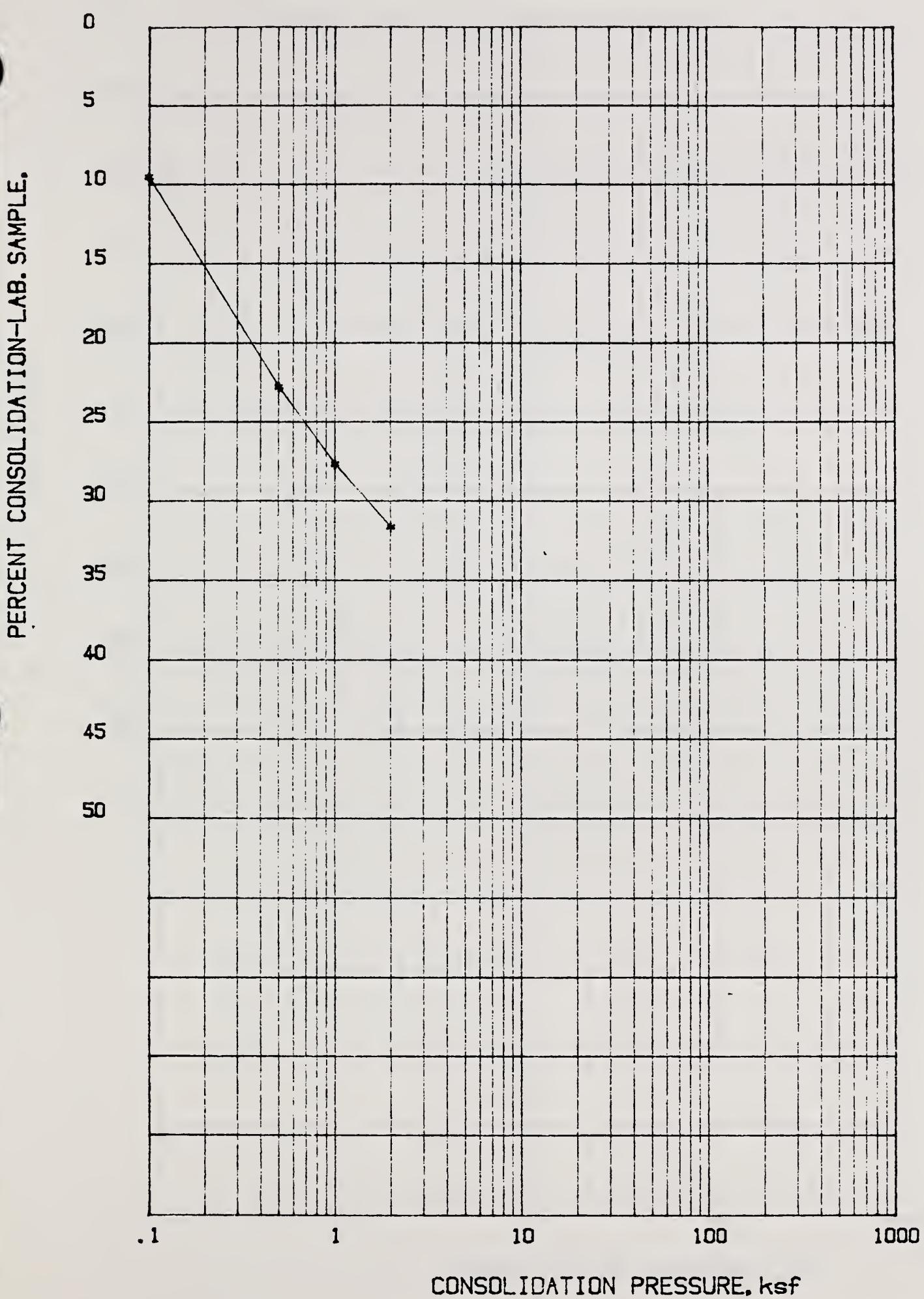
Sample description: COMPACTED TO 1.0 GMS/CC SATURATED AT START OF TEST

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	92.57 g
INITIAL DRY WEIGHT:	80.43 g
INITIAL WATER CONTENT:	15 %
INITIAL WET DENSITY:	71.844 PCF
INITIAL DRY DENSITY:	62.422 PCF
SPECIFIC GRAVITY:	2.61
INITIAL VOID RATIO:	1.61
FINAL WET WEIGHT:	106.24 g
FINAL WATER CONTENT:	32 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	SuX
1.0	.10	.0953	1.3610	9.53
2.0	.50	.2282	1.0140	22.82
3.0	1.00	.2774	.8860	27.74
4.0	2.00	.3172	.7820	31.72



Test 2



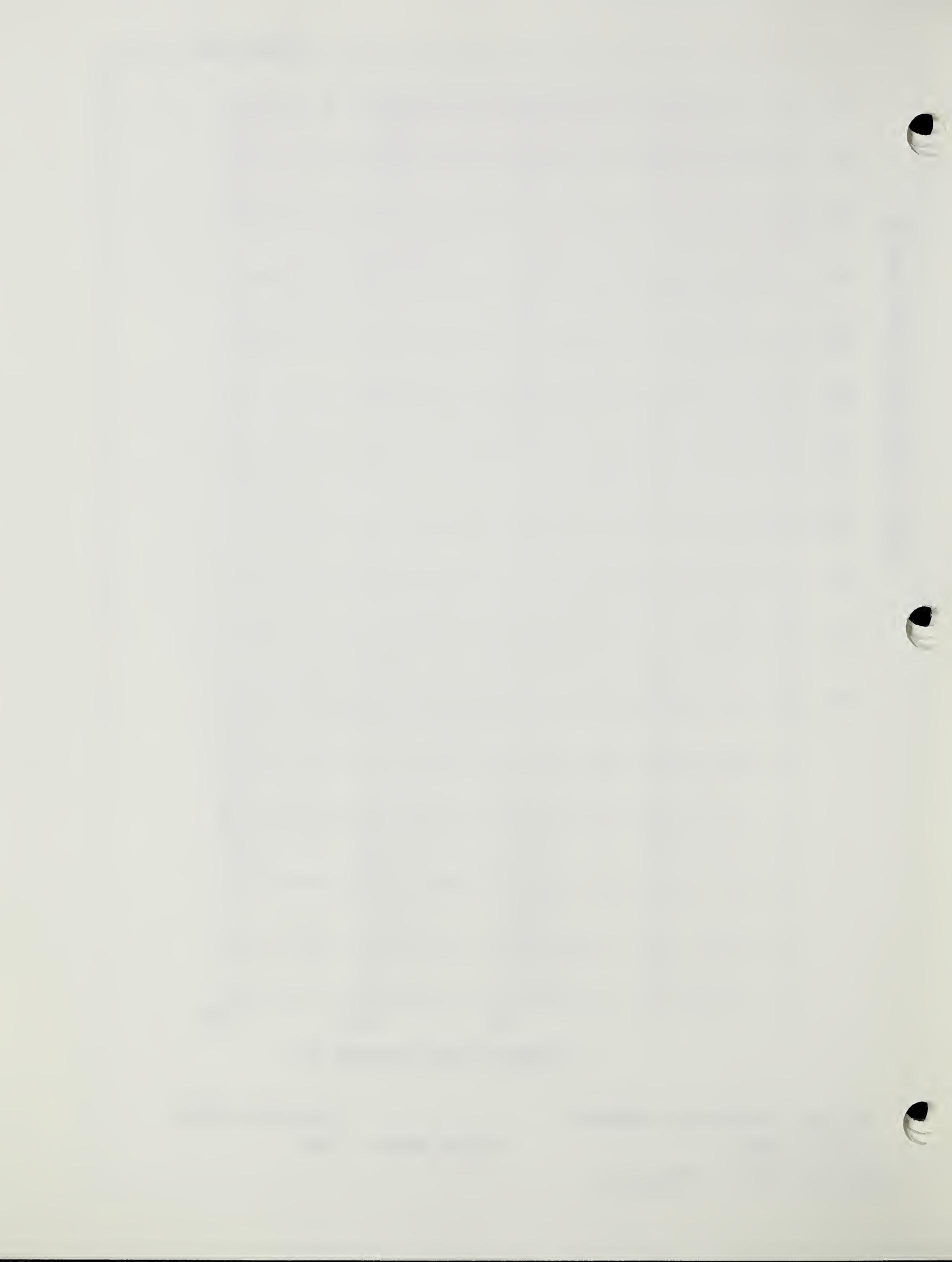
Project: LOS BANOS-FRESNO CA

LAB. NUMBER 88C96

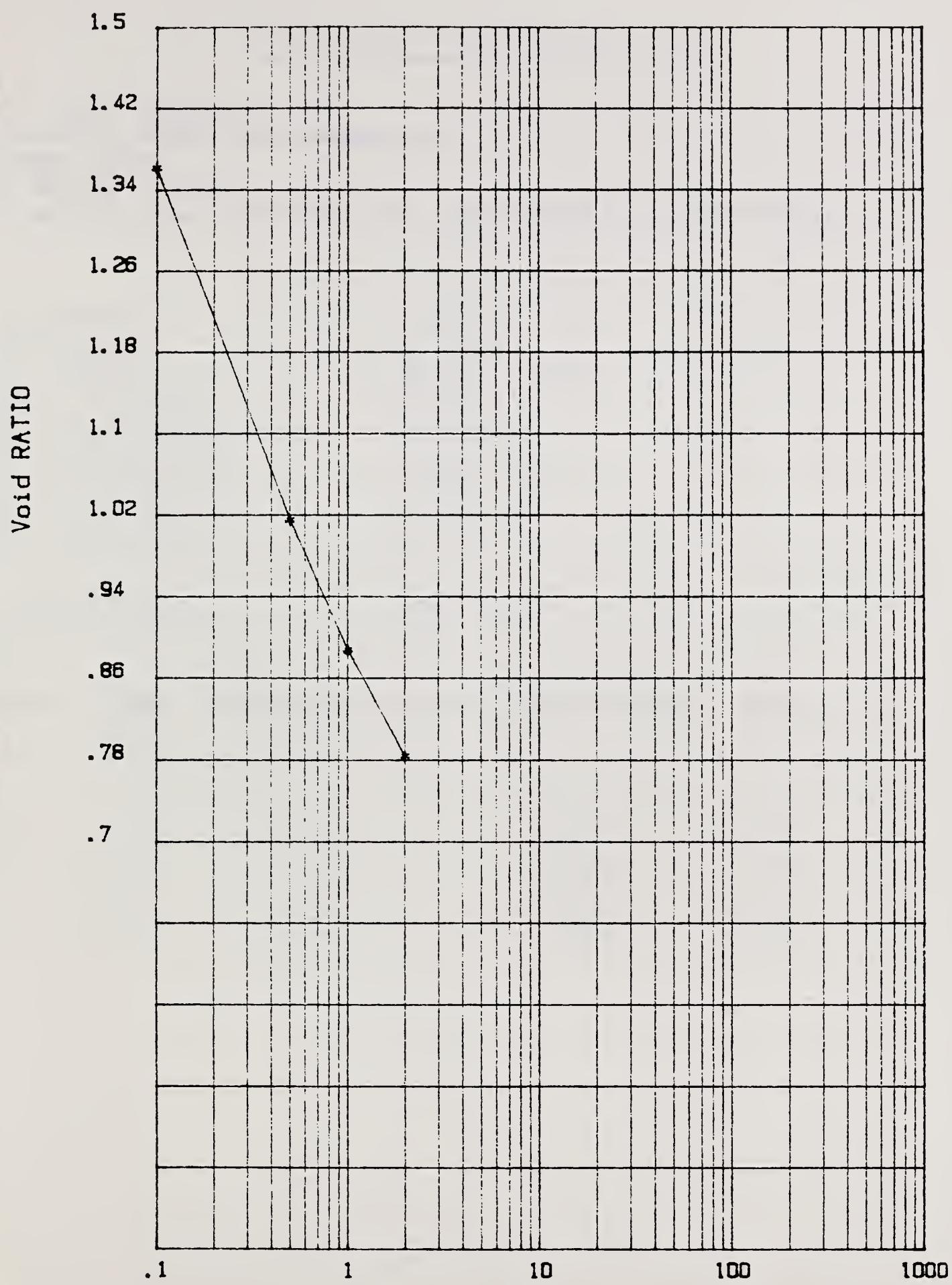
Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.

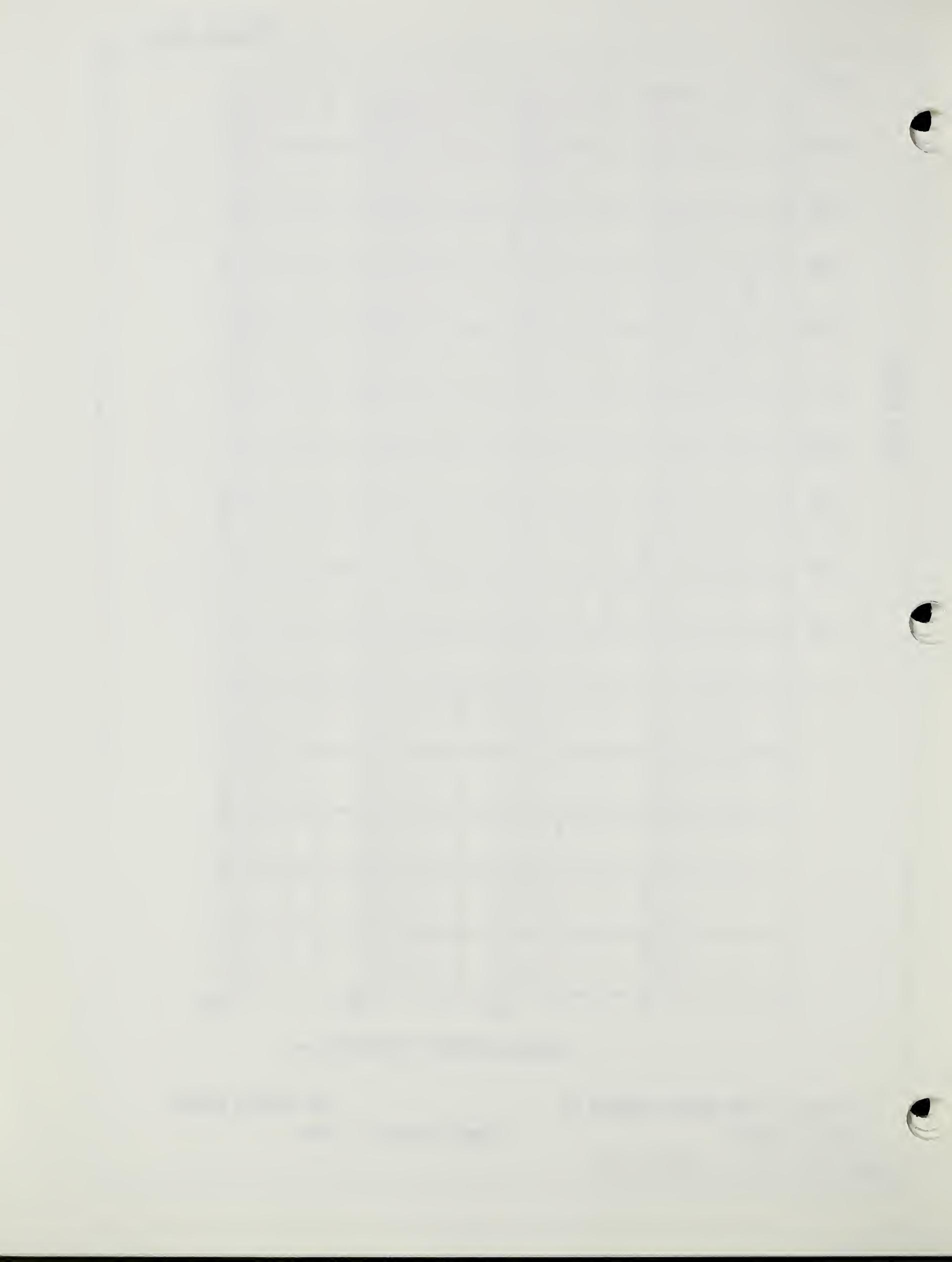


Test 2



Project: LOS BANOS-FRESNO CA
Field number:
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C96
Sample depth: Feet



RESULTS OF CONSOLIDATION TEST

=====

Project: WEPP SAMPLE

Field number: PIERE-COTTONWOOD SD.

LAB. NUMBER 88C97

Sample depth: - Feet

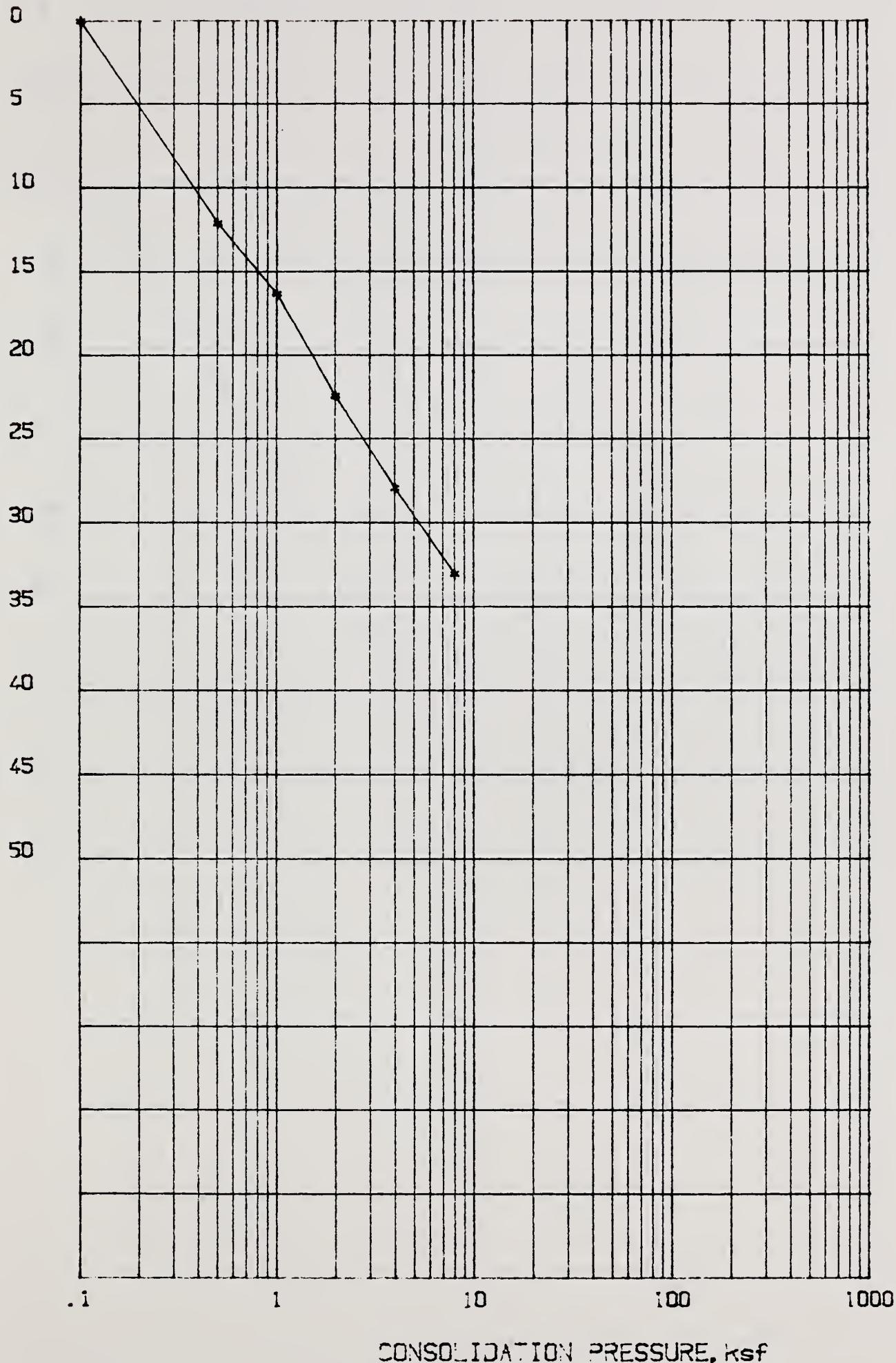
Sample description: REMOLDED TO 1.05 GMS/CC CH LL=52 PI=32

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	98.35 g
INITIAL DRY WEIGHT:	84.46 g
INITIAL WATER CONTENT:	16.4 %
INITIAL WET DENSITY:	76.33 PCF
INITIAL DRY DENSITY:	65.55 PCF
SPECIFIC GRAVITY:	2.71
INITIAL VOID RATIO:	1.581
FINAL WET WEIGHT:	108.92 g
FINAL WATER CONTENT:	28.9 %

INCREMENT (ksf)	LOAD	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	0.0000	1.5810	0.00
2.0	.50	.1214	1.2670	12.14
3.0	1.00	.1638	1.1580	16.38
4.0	2.00	.2251	1.0000	22.51
5.0	4.00	.2802	.8570	28.02
6.0	8.00	.3313	.7250	33.13



PERCENT CONSOLIDATION-LAB. SAMPLE.

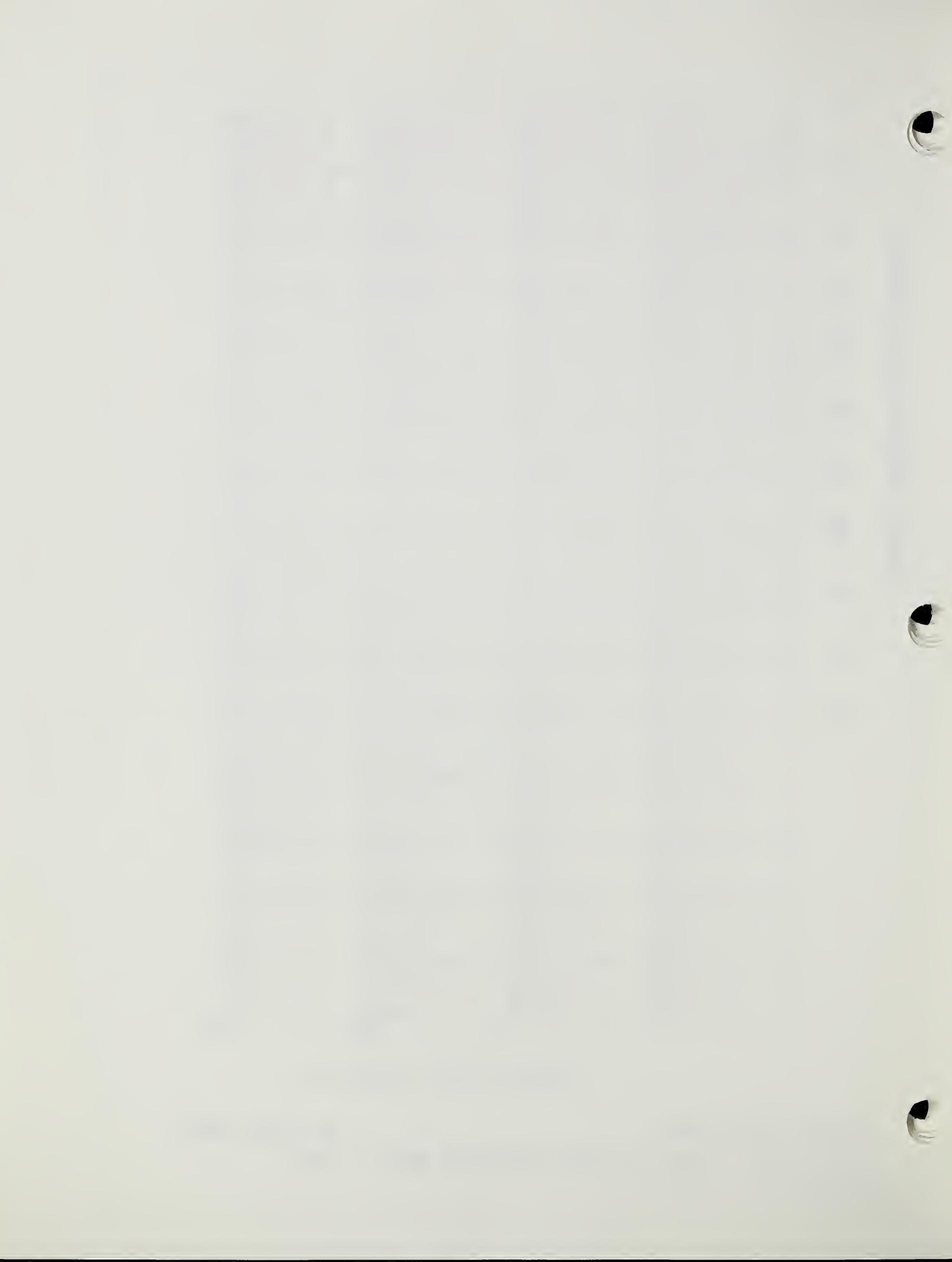


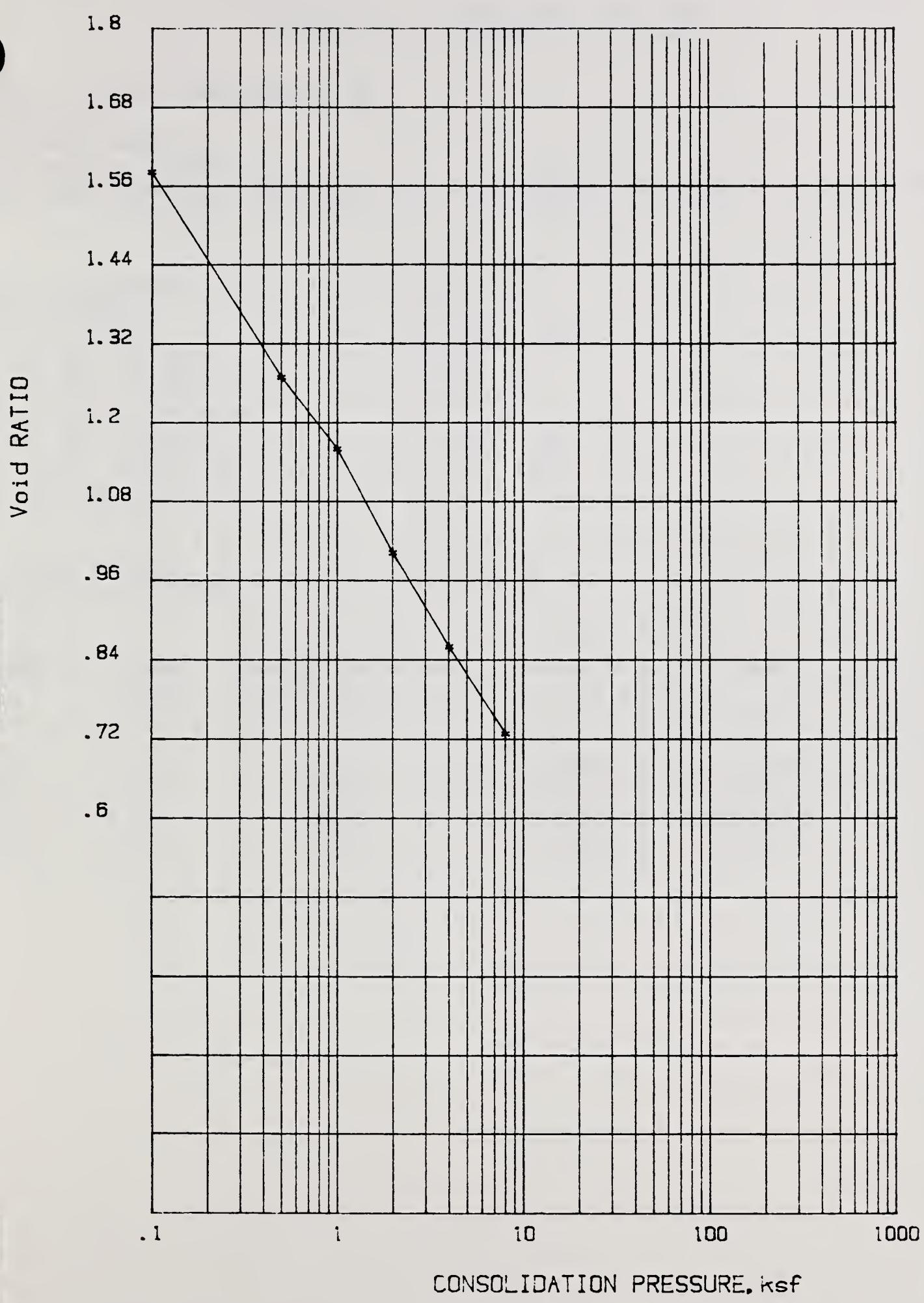
Project: WEPP SAMPLE

LAB. NUMBER 88C97

Field number: PIERE-COTTONWOOD SJ Sample depth: - Feet

USDA-SCS S. M. L. LINCOLN NE.



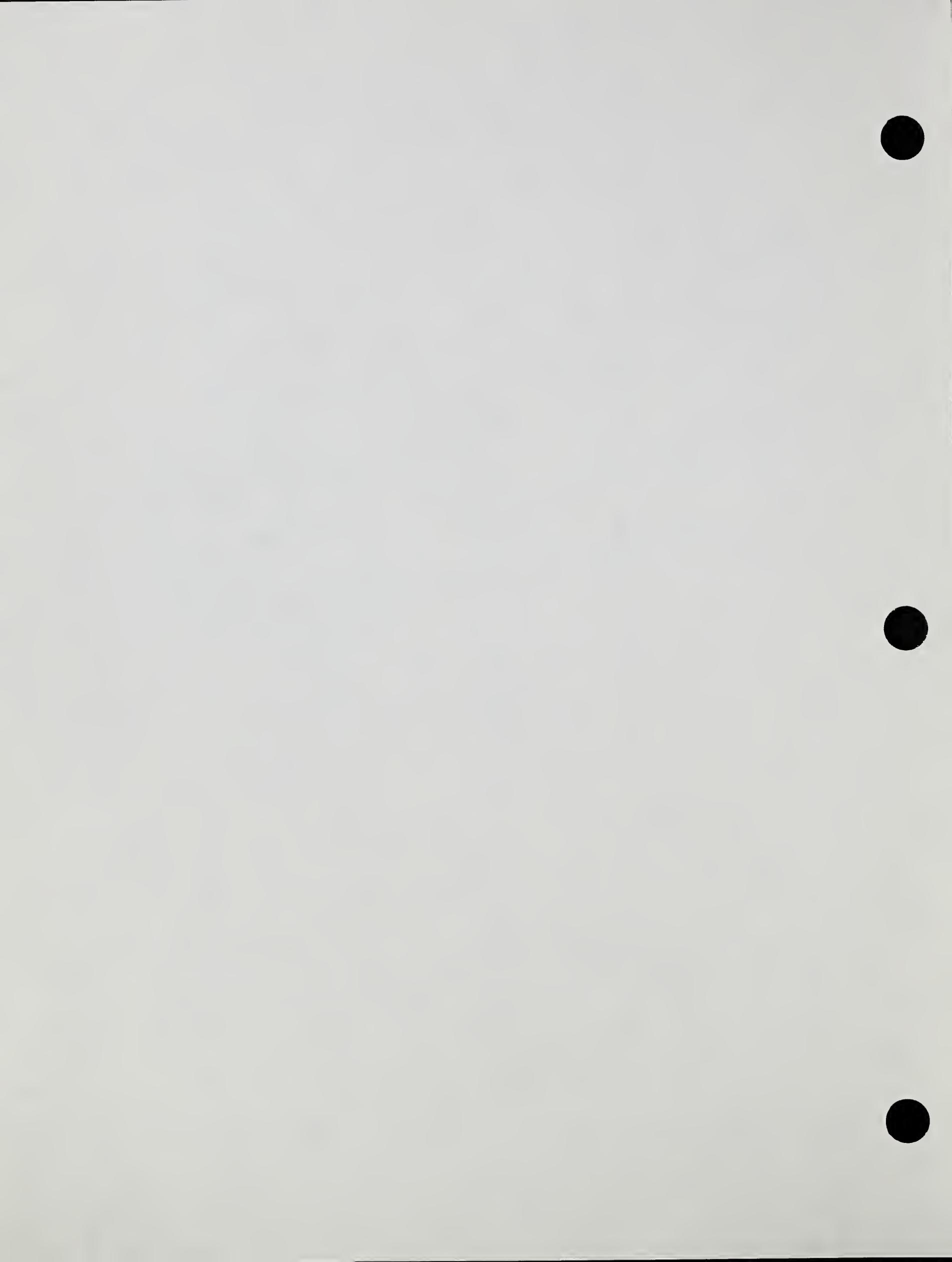


Project: WEPP SAMPLE

LAB. NUMBER 88C97

Field number: PIERE-COTTONWOOD SD Sample depth: - Feet

USDA-SCS S. M. L. LINCOLN NE.



Test 2

RESULTS OF CONSOLIDATION TEST

=====

Project: PIERRE-COTTONWOOD SD

Field number:

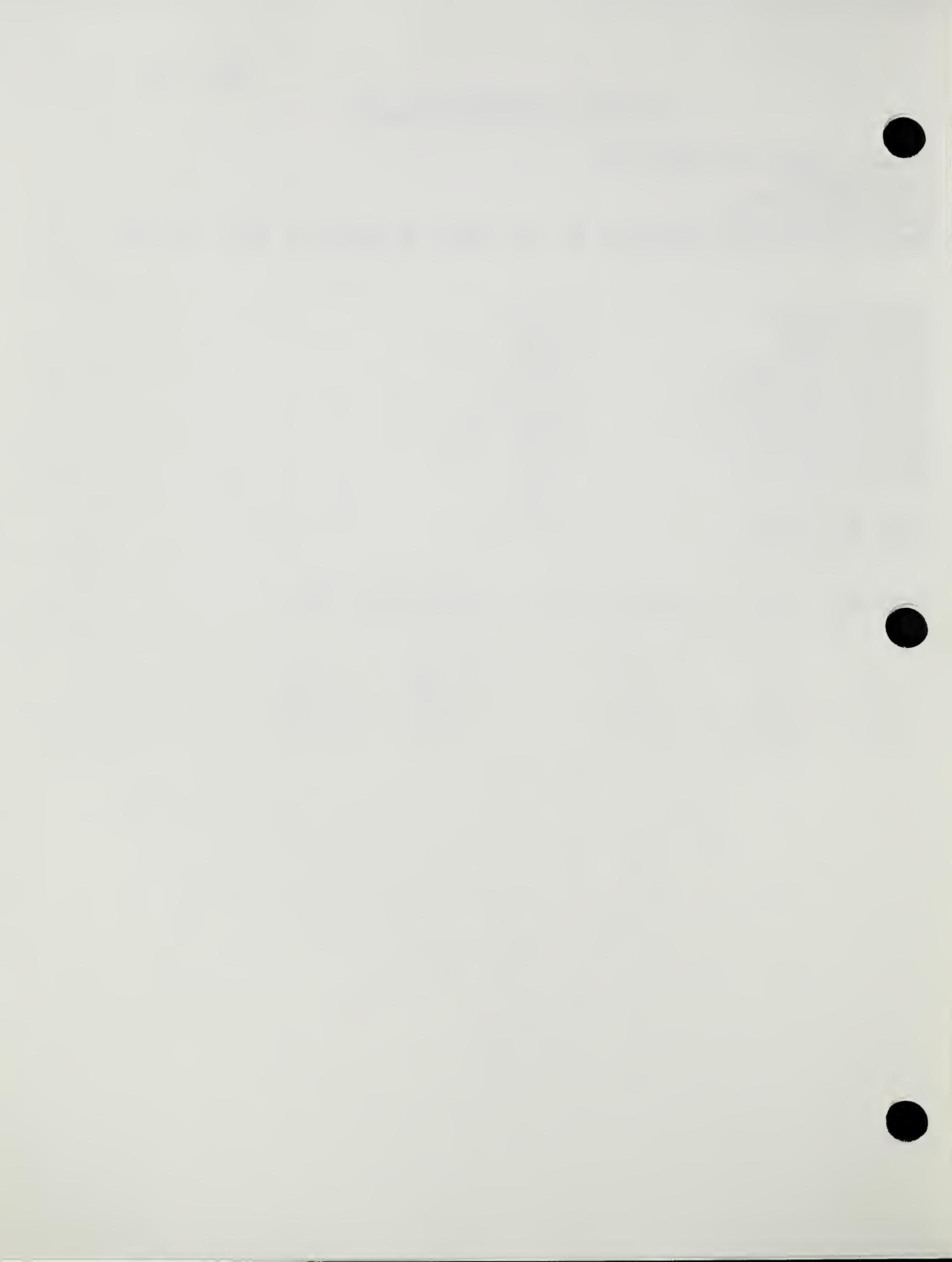
LAB. NUMBER 88C97

Sample depth: Feet

Sample description: COMPACTED TO 1.05 GMS/CC SATURATED AT START OF TEST

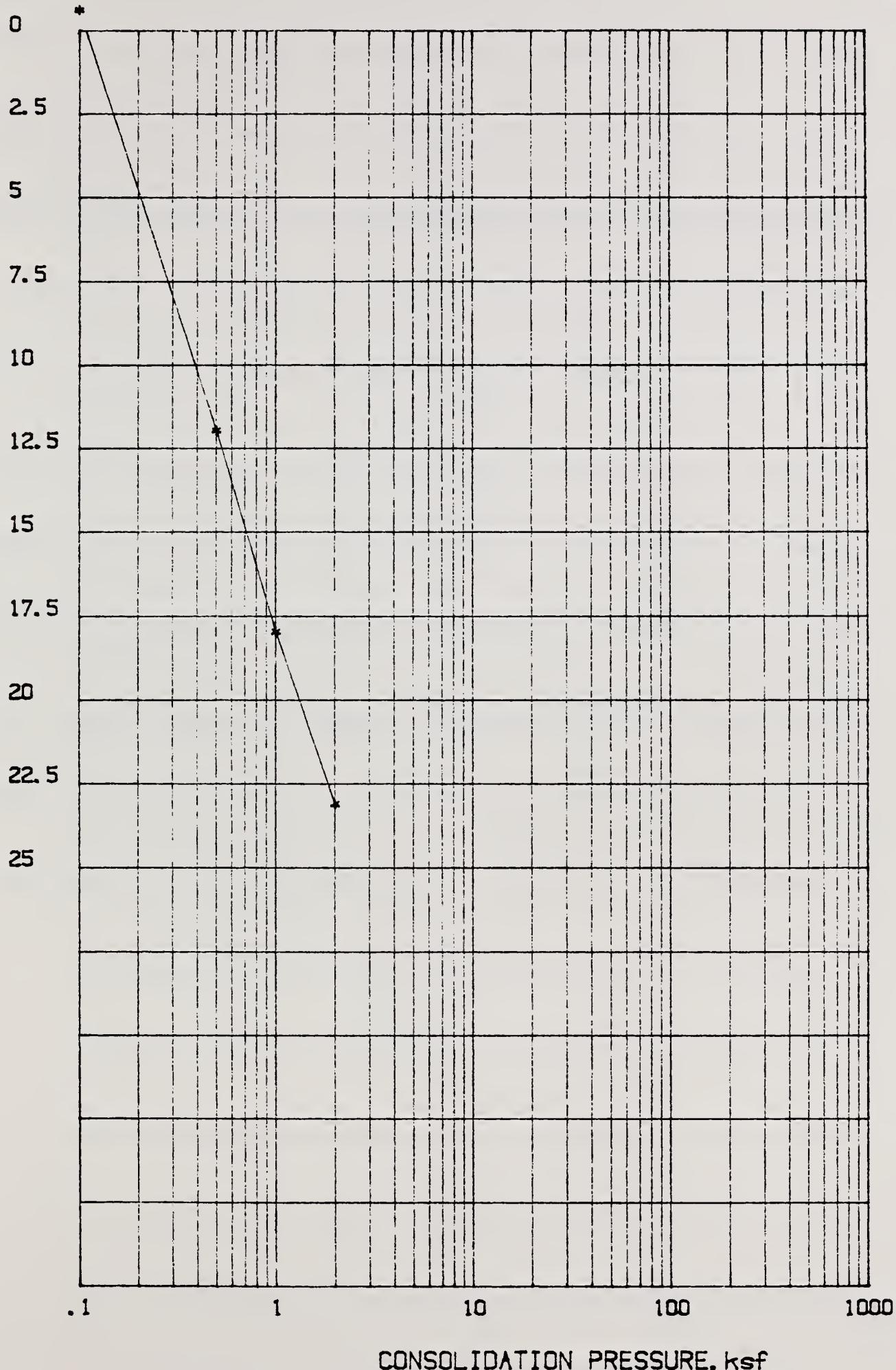
SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	100.7 g
INITIAL DRY WEIGHT:	84.45 g
INITIAL WATER CONTENT:	19.2 %
INITIAL WET DENSITY:	78.154 PCF
INITIAL DRY DENSITY:	65.542 PCF
SPECIFIC GRAVITY:	2.71
INITIAL VOID RATIO:	1.581
FINAL WET WEIGHT:	113.08 g
FINAL WATER CONTENT:	33.9 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	-.0064	1.5970	-.64
2.0	.50	.1198	1.2720	11.98
3.0	1.00	.1799	1.1160	17.99
4.0	2.00	.2315	.9830	23.15



Test 2

PERCENT CONSOLIDATION-LAB. SAMPLE.



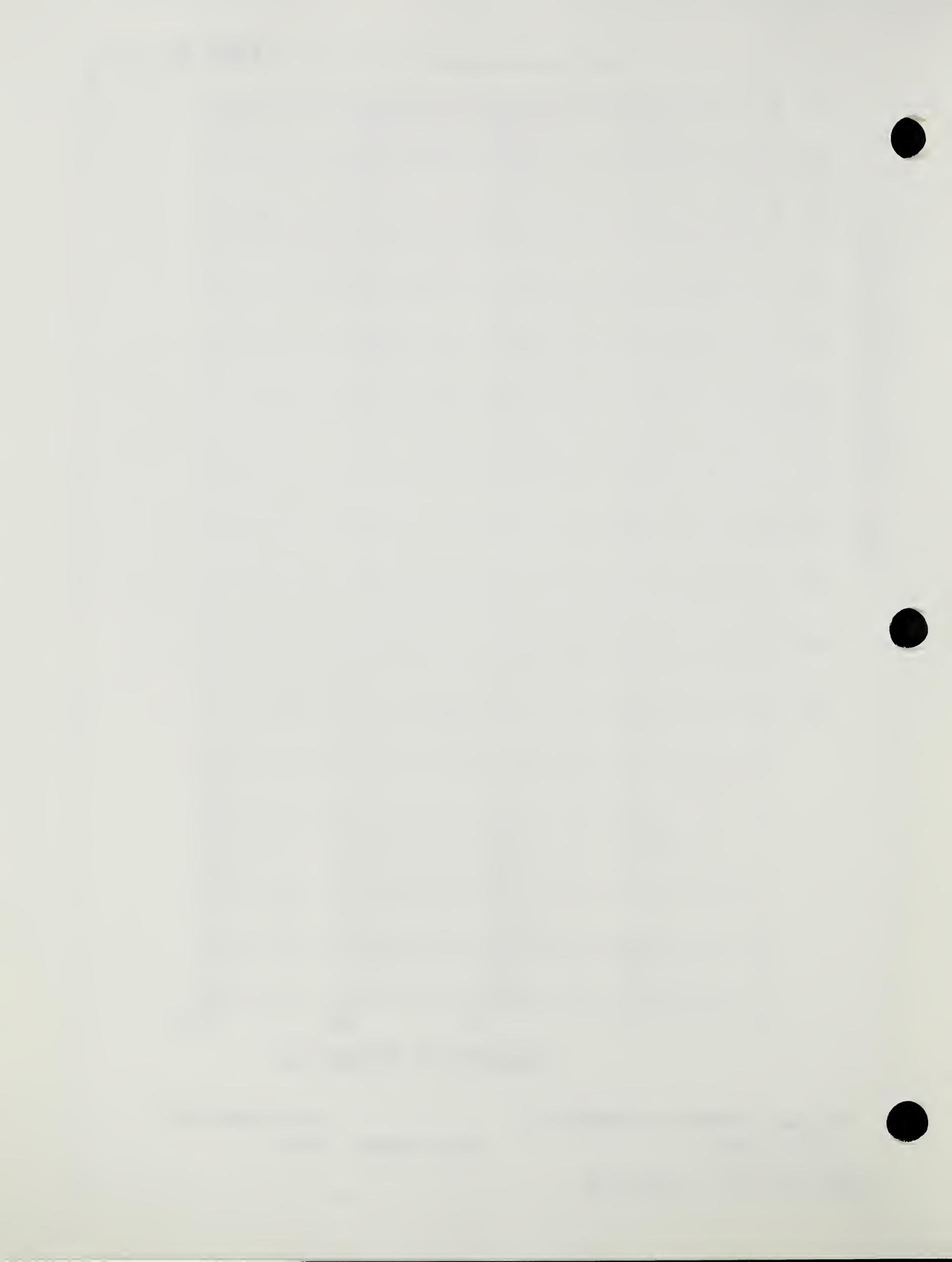
Project: PIERRE-COTTONWOOD SD

LAB. NUMBER 88C97

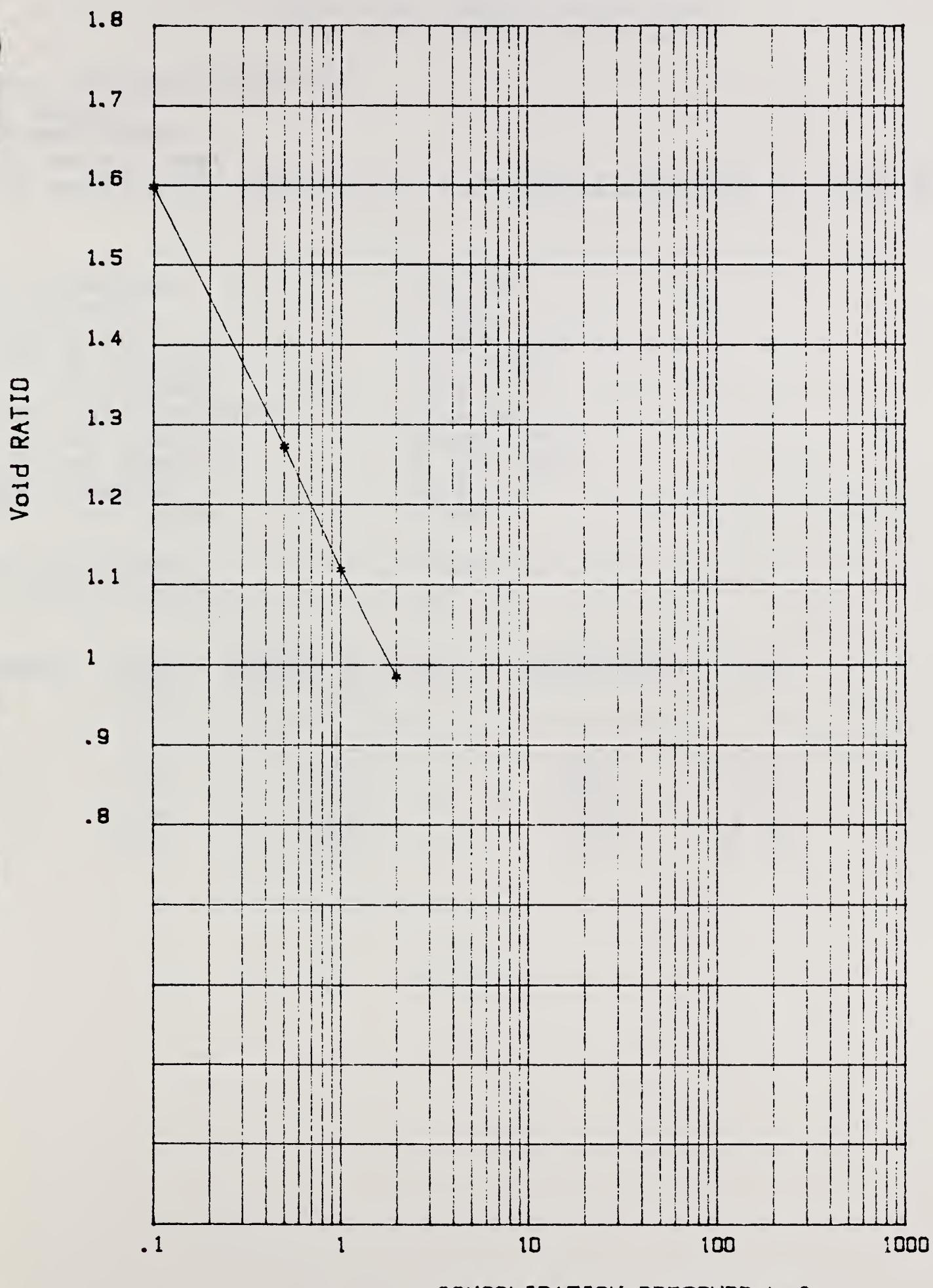
Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



Test 2



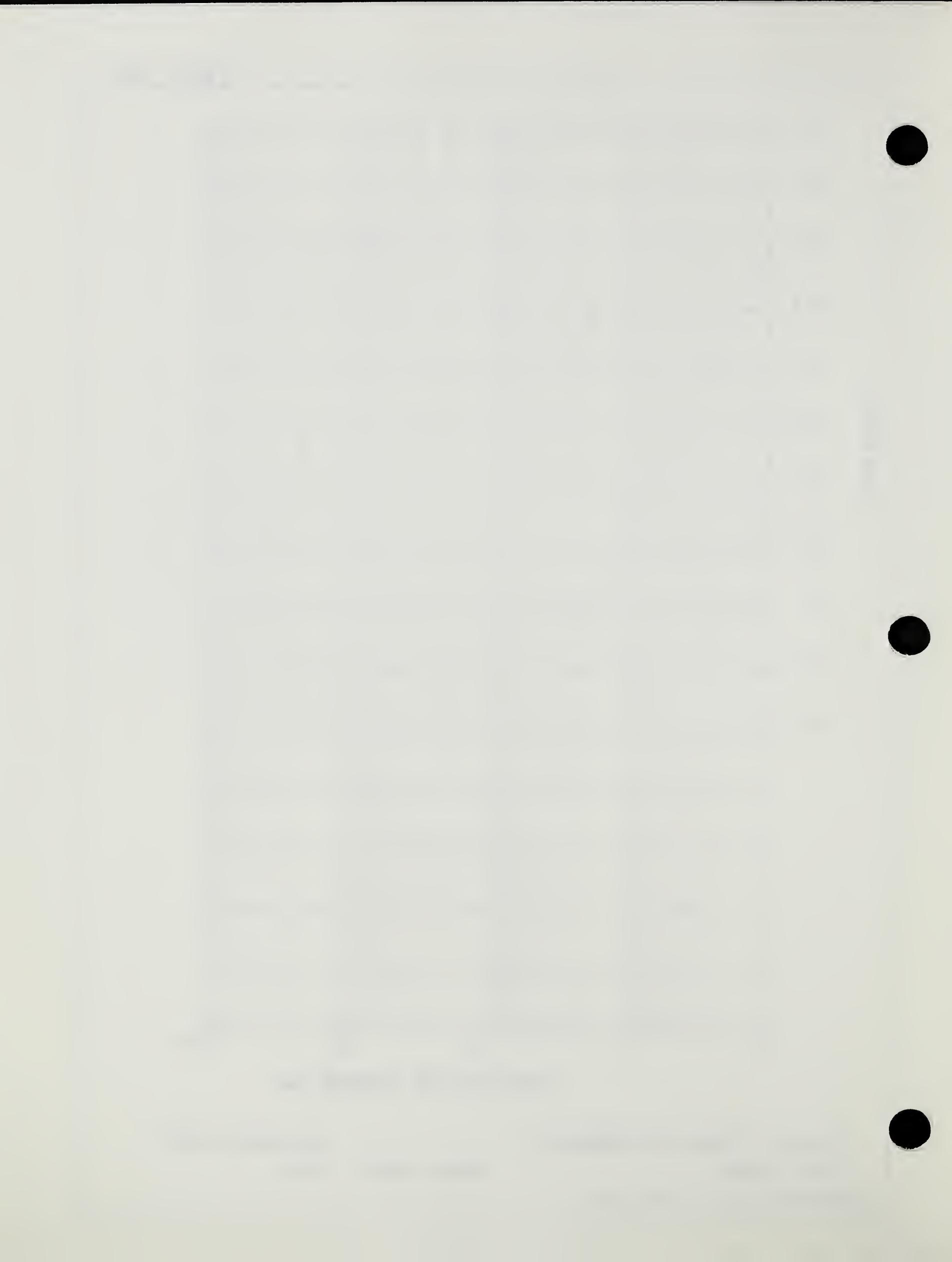
Project: PIERRE-COTTONWOOD SD

LAB. NUMBER 88C97

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



RESULTS OF CONSOLIDATION TEST

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Project: PALOUSE-PULLMAN WA.

Field number:

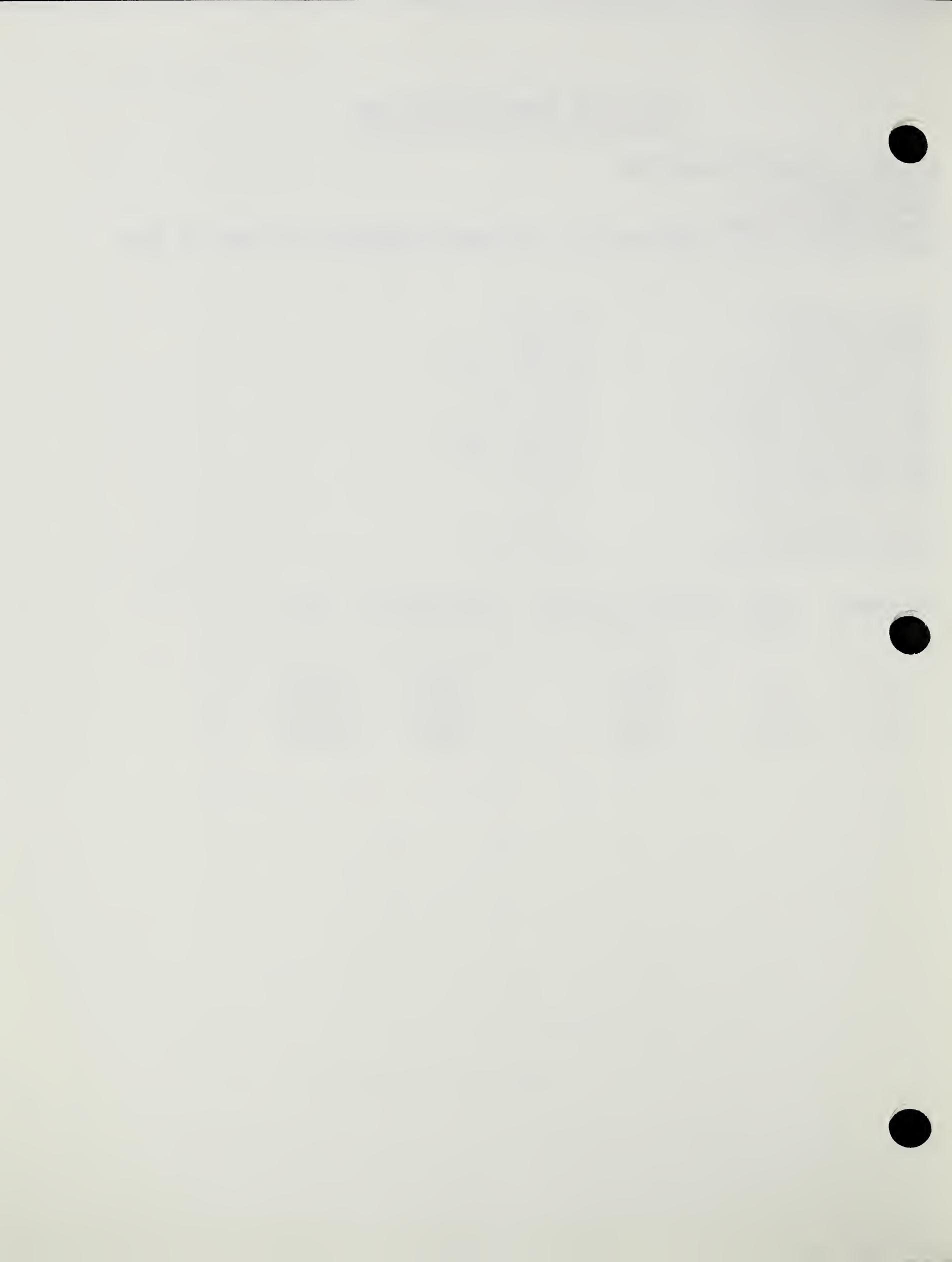
LAB. NUMBER 88C98

Sample depth: Feet

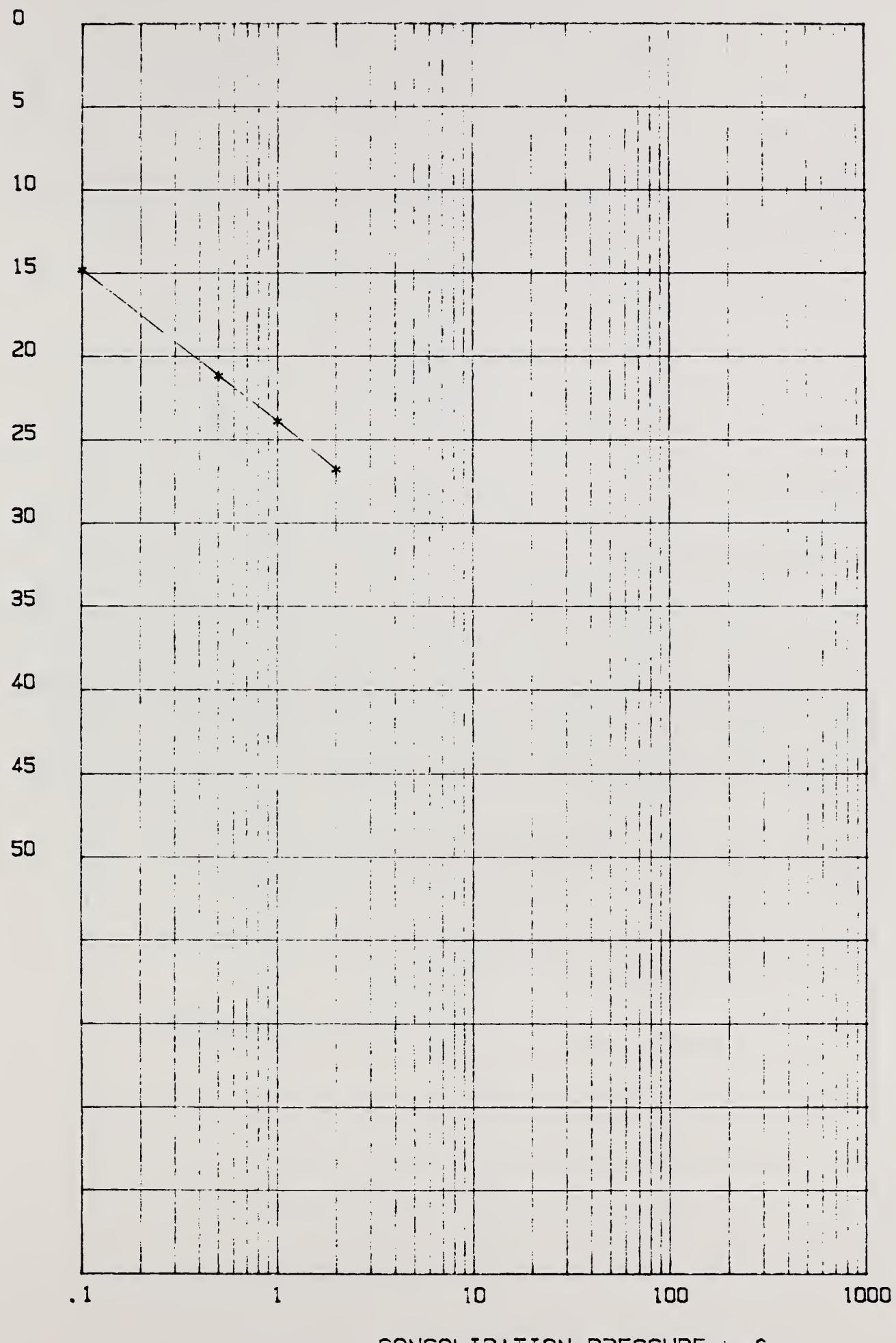
Sample description: COMPACTED TO 1.15 GMS/CC SATURATED AT START OF TEST

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	104.17 g
INITIAL DRY WEIGHT:	92.51 g
INITIAL WATER CONTENT:	12.6 %
INITIAL WET DENSITY:	80.847 PCF
INITIAL DRY DENSITY:	71.797 PCF
SPECIFIC GRAVITY:	2.64 /
INITIAL VOID RATIO:	1.295 /
FINAL WET WEIGHT:	119.29 g
FINAL WATER CONTENT:	28.9 %

INCREMENT -----	LOAD (ksf) -----	CHANGE IN HEIGHT (ins) -----	VOIDS RATIO -----	Su% -----
1.0	.10	.1483	.9550	14.83
2.0	.50	.2123	.8080	21.23
3.0	1.00	.2395	.7450	23.95
4.0	2.00	.2683	.6790	26.83



PERCENT CONSOLIDATION-LAB. SAMPLE.



CONSOLIDATION PRESSURE, ksf

Project: PALOUSE-PULLMAN WA.

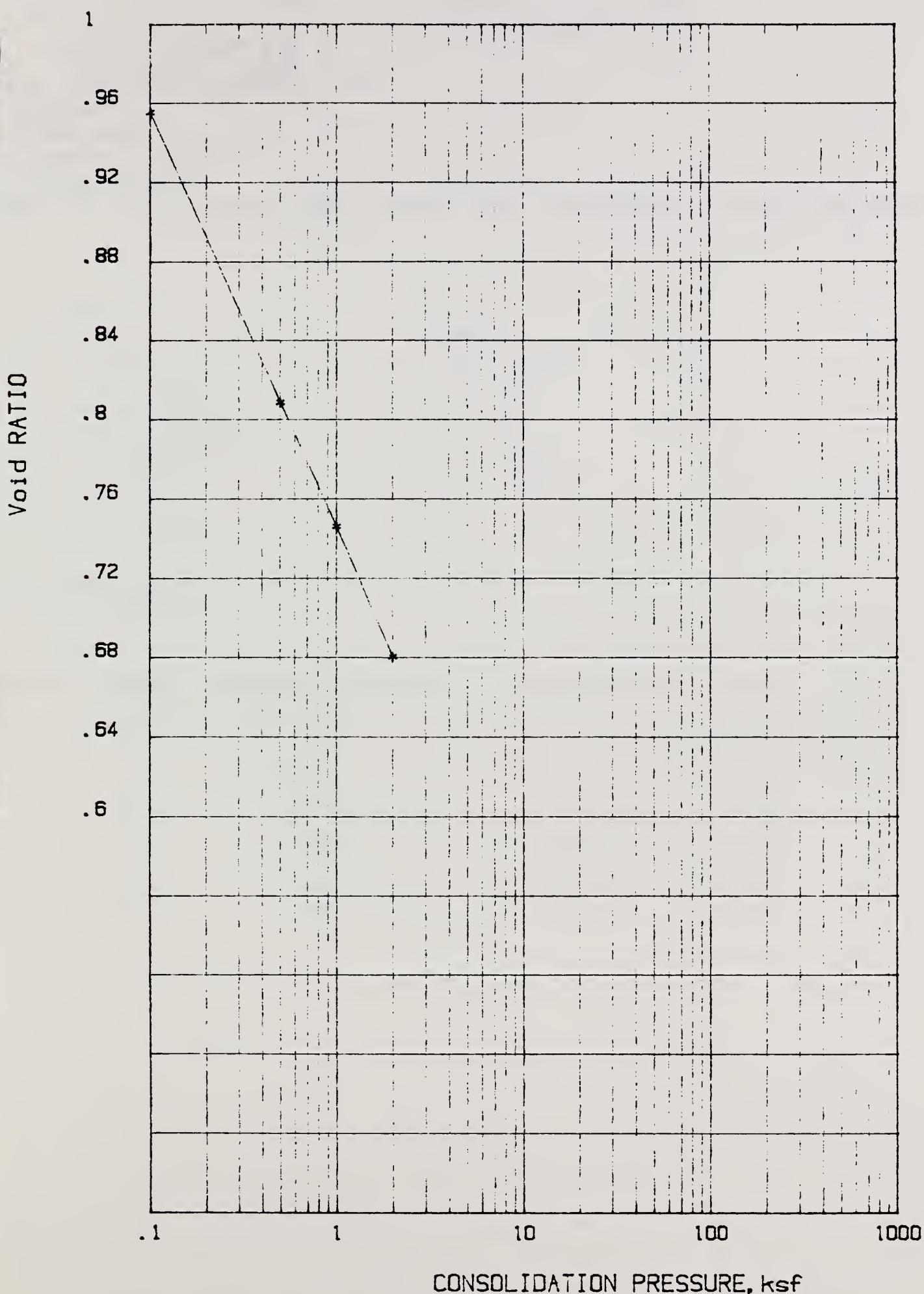
LAB. NUMBER 88C98

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.





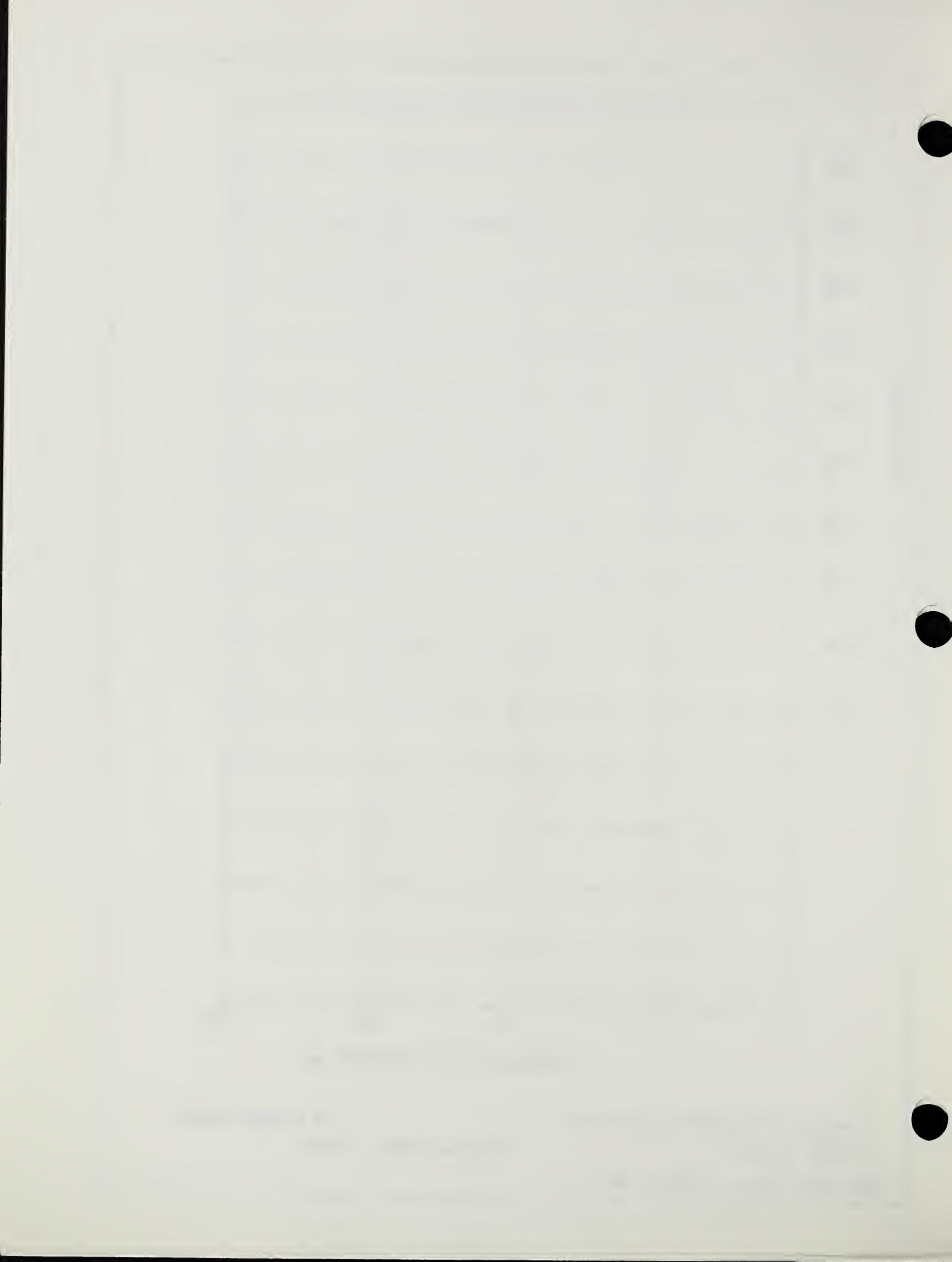
Project: PALOUSE-PULLMAN WA.

LAB. NUMBER 88C98

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



RESULTS OF CONSOLIDATION TEST

WEPP Sample

Project: PORTNEUF-KIMBERLY ID.

Field number:

LAB. NUMBER 88C99

Sample depth: Feet

Sample description:

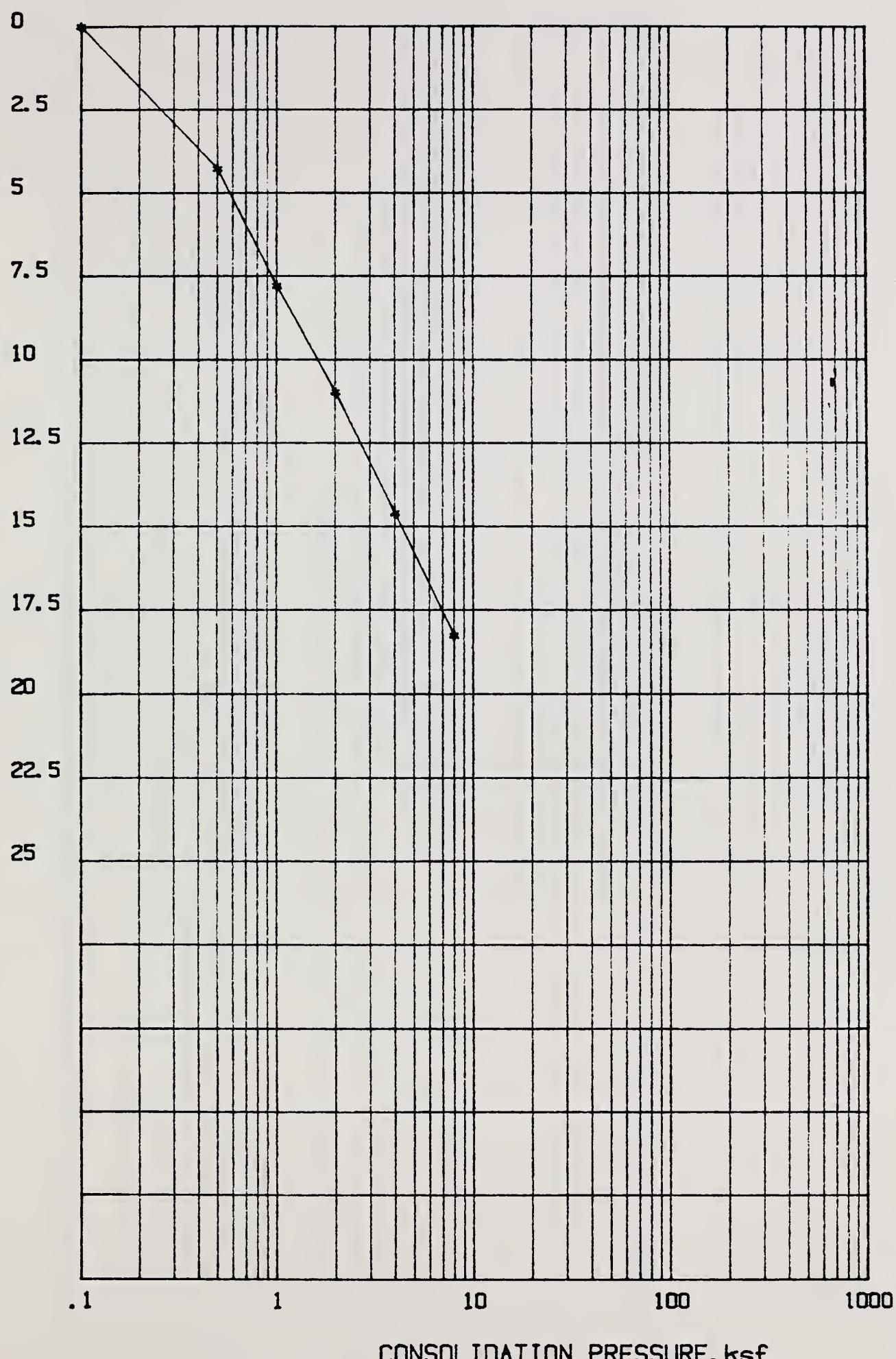
REMOLDED TO 1.25 GM/CC CL-ML LL=28 PI=4 SATURATED AT START OF TEST

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	116.42 g
INITIAL DRY WEIGHT:	100.55 g
INITIAL WATER CONTENT:	15.7 %
INITIAL WET DENSITY:	90.354 PCF
INITIAL DRY DENSITY:	78.037 PCF
SPECIFIC GRAVITY:	2.66
INITIAL VOID RATIO:	1.127
FINAL WET WEIGHT:	129.37 g
FINAL WATER CONTENT:	28.6 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.0000	1.1270	0.00
2.0	.50	.0429	1.0360	4.29
3.0	1.00	.0761	.9610	7.81
4.0	2.00	.1100	.8930	11.00
5.0	4.00	.1463	.8160	14.63
6.0	8.00	.1830	.7380	18.30



PERCENT CONSOLIDATION-LAB. SAMPLE.



Project: PORTNEUF-KIMBERLY ID.

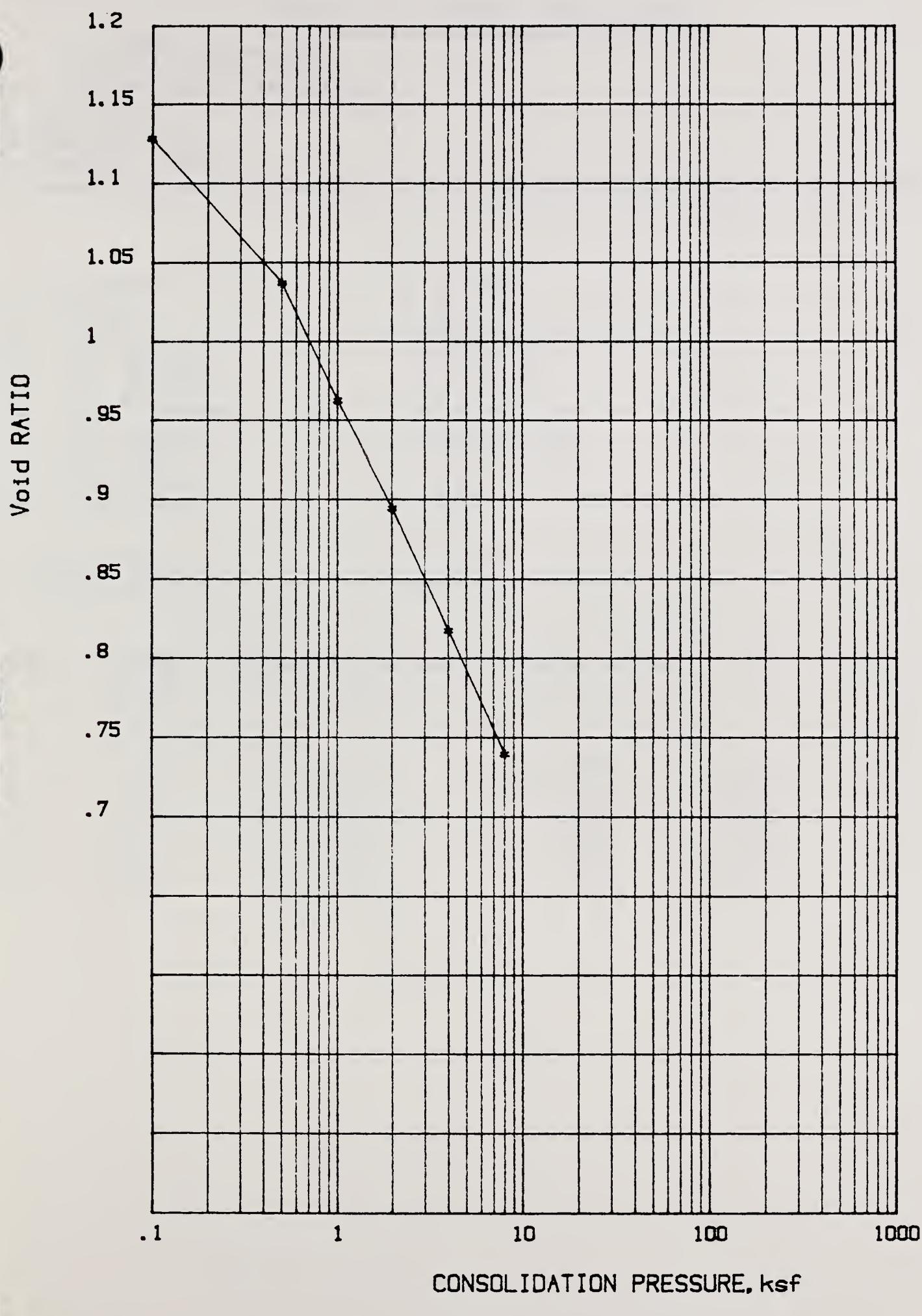
Field number:

USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C99

Sample depth: Feet





Project: PORTNEUF-KIMBERLY ID.

LAB. NUMBER 88C99

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



RESULTS OF CONSOLIDATION TEST

WEPP Sample

Project: SHARPSBURG LINCON NE.

Field number:

LAB. NUMBER 88C100

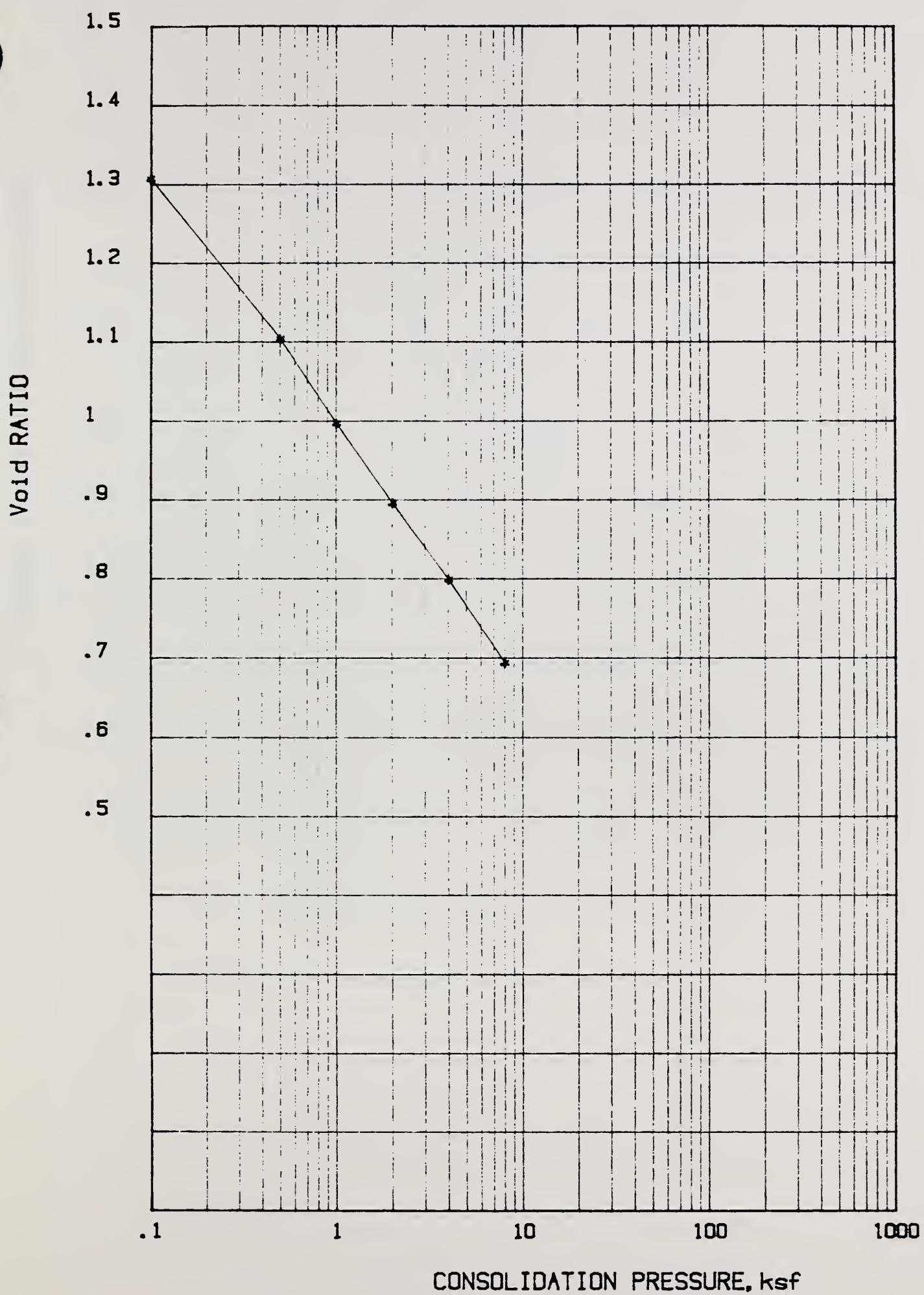
Sample depth: Feet

Sample description: COMPACTED TO 1.14 GM/CC SATURATED AT START OF TEST

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	109.98 g
INITIAL DRY WEIGHT:	91.7 g
INITIAL WATER CONTENT:	19.9 %
INITIAL WET DENSITY:	85.354 PCF
INITIAL DRY DENSITY:	71.169 PCF
SPECIFIC GRAVITY:	2.63
INITIAL VOID RATIO:	1.307
FINAL WET WEIGHT:	115.95 g
FINAL WATER CONTENT:	26.4 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.0000	1.3070	0.00
2.0	.50	.0886	1.1020	8.86
3.0	1.00	.1350	.9950	13.50
4.0	2.00	.1789	.8940	17.89
5.0	4.00	.2207	.7970	22.09
6.0	8.00	.2666	.6910	26.66





Project: SHARPSBURG LINCOLN NE.

LAB. NUMBER 88C100

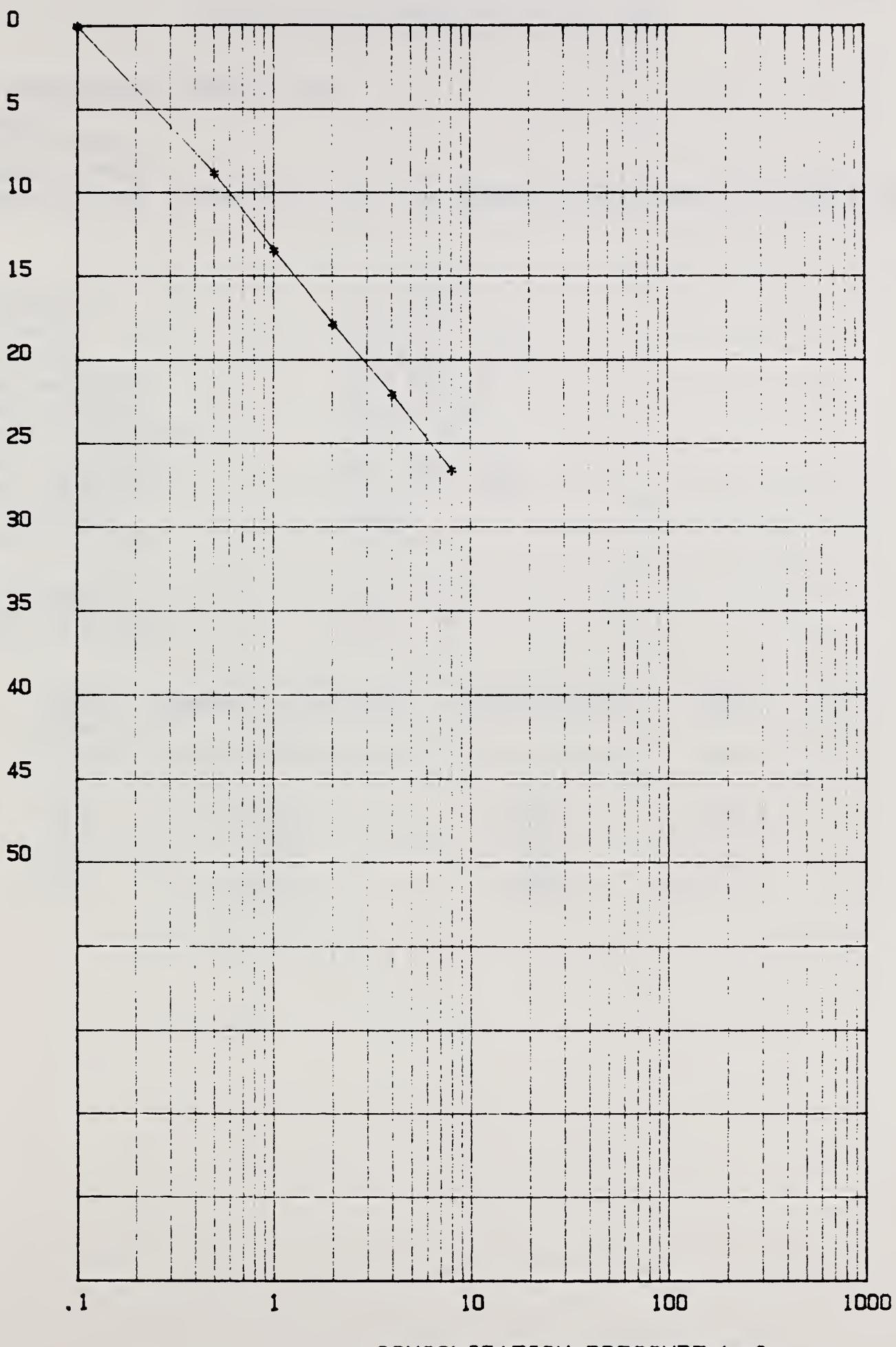
Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



PERCENT CONSOLIDATION-LAB. SAMPLE.



Project: SHARPSBURG LINCON NE.

LAB. NUMBER 88C100

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



Test 2

RESULTS OF CONSOLIDATION TEST

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Project: SHARPSBURG-LINCOLN NE

Field number:

LAB.NUMBER 88C100

Sample depth: Feet

Sample description: COMPACTED TO 1.14 GMS/CC SATURATED AT START OF TEST

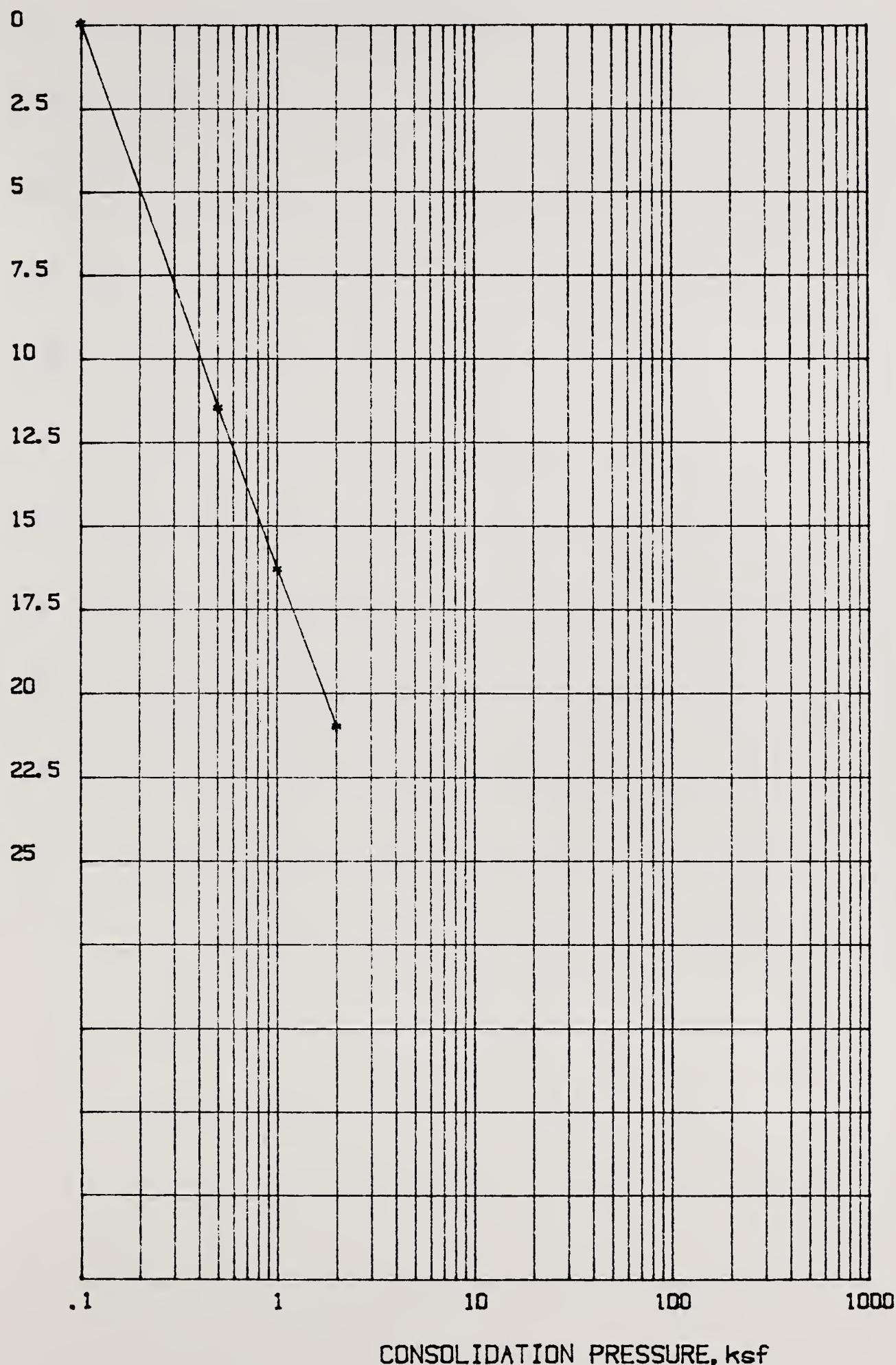
SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	107.87 g
INITIAL DRY WEIGHT:	91.69 g
INITIAL WATER CONTENT:	17.6 %
INITIAL WET DENSITY:	83.718 PCF
INITIAL DRY DENSITY:	71.161 FCF
SPECIFIC GRAVITY:	2.63
INITIAL VOID RATIO:	1.307
FINAL WET WEIGHT:	121.47 g
FINAL WATER CONTENT:	32.4 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	-.0005	1.3080	-.05
2.0	.50	.1148	1.0420	11.48
3.0	1.00	.1632	.9300	16.32
4.0	2.00	.2102	.8220	21.02



Test 2

PERCENT CONSOLIDATION-LAB. SAMPLE.



Project: SHARPSBURG-LINCOLN NE

Field number:

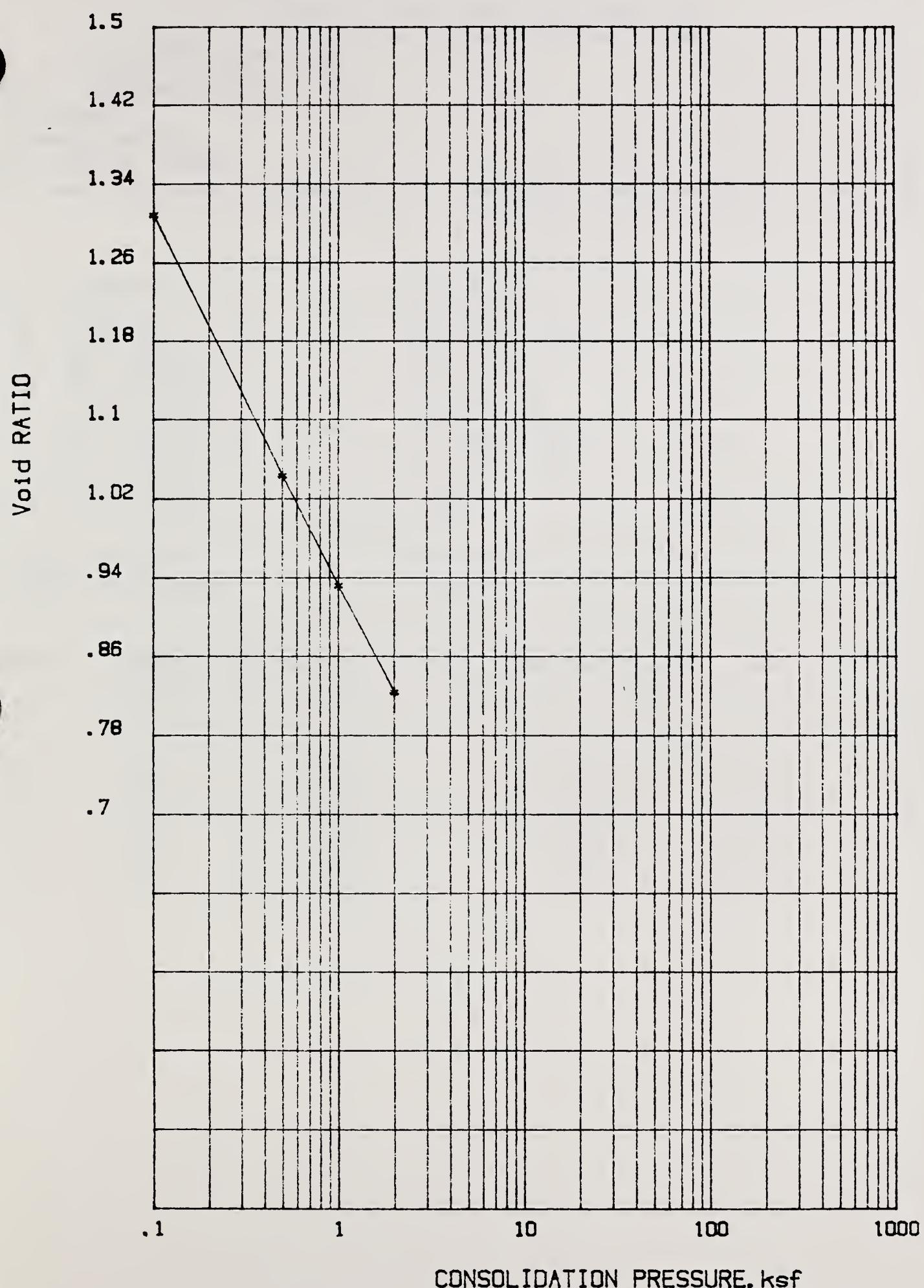
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C100

Sample depth: Feet



Test 2



Project: SHARPSBURG-LINCOLN NE

LAB. NUMBER 88C100

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



RESULTS OF CONSOLIDATION TEST

WEPP Sample

Project: SVERDRUP-MORRIS MN.

Field number:

LAB. NUMBER 88C101

Sample depth: Feet

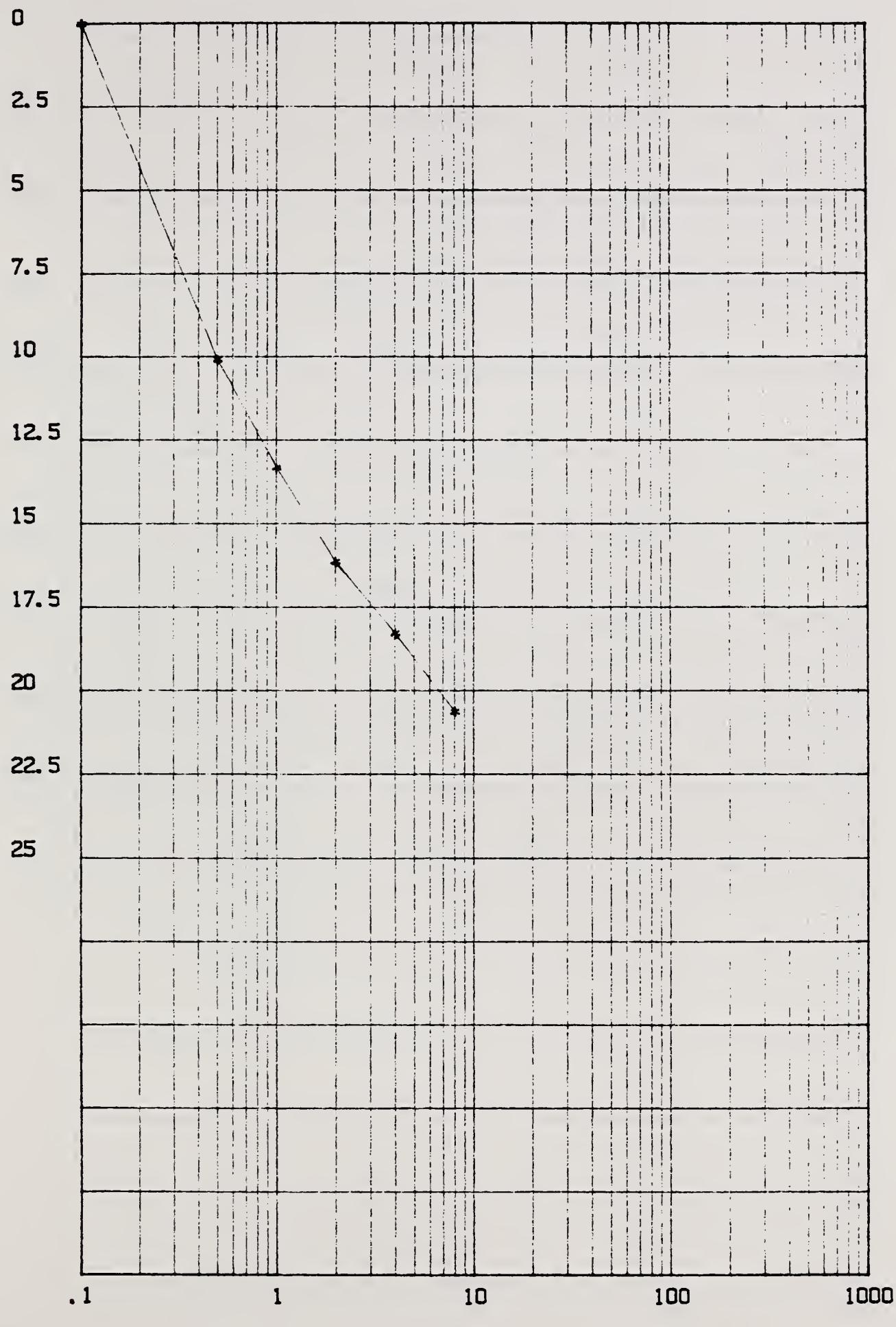
Sample description: COMPACTED TO 1.46 GM/CC SATURATED AT START OF TEST

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	129.4 g
INITIAL DRY WEIGHT:	117.41 g
INITIAL WATER CONTENT:	10.2 %
INITIAL WET DENSITY:	100.428 PDD
INITIAL DRY DENSITY:	91.122 PCF
SPECIFIC GRAVITY:	2.63
INITIAL VOID RATIO:	.801
FINAL WET WEIGHT:	137.53 g
FINAL WATER CONTENT:	17.1 %

INCREMENT (ksf)	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.0000	.8010	0.00
2.0	.50	.1011	.6190	10.11
3.0	1.00	.1336	.5610	13.36
4.0	2.00	.1617	.5100	16.17
5.0	4.00	.1833	.4710	18.33
6.0	8.00	.2068	.4290	20.68



PERCENT CONSOLIDATION-LAB. SAMPLE,



CONSOLIDATION PRESSURE, ksf

Project: SVERDRUP-MORRIS MN.

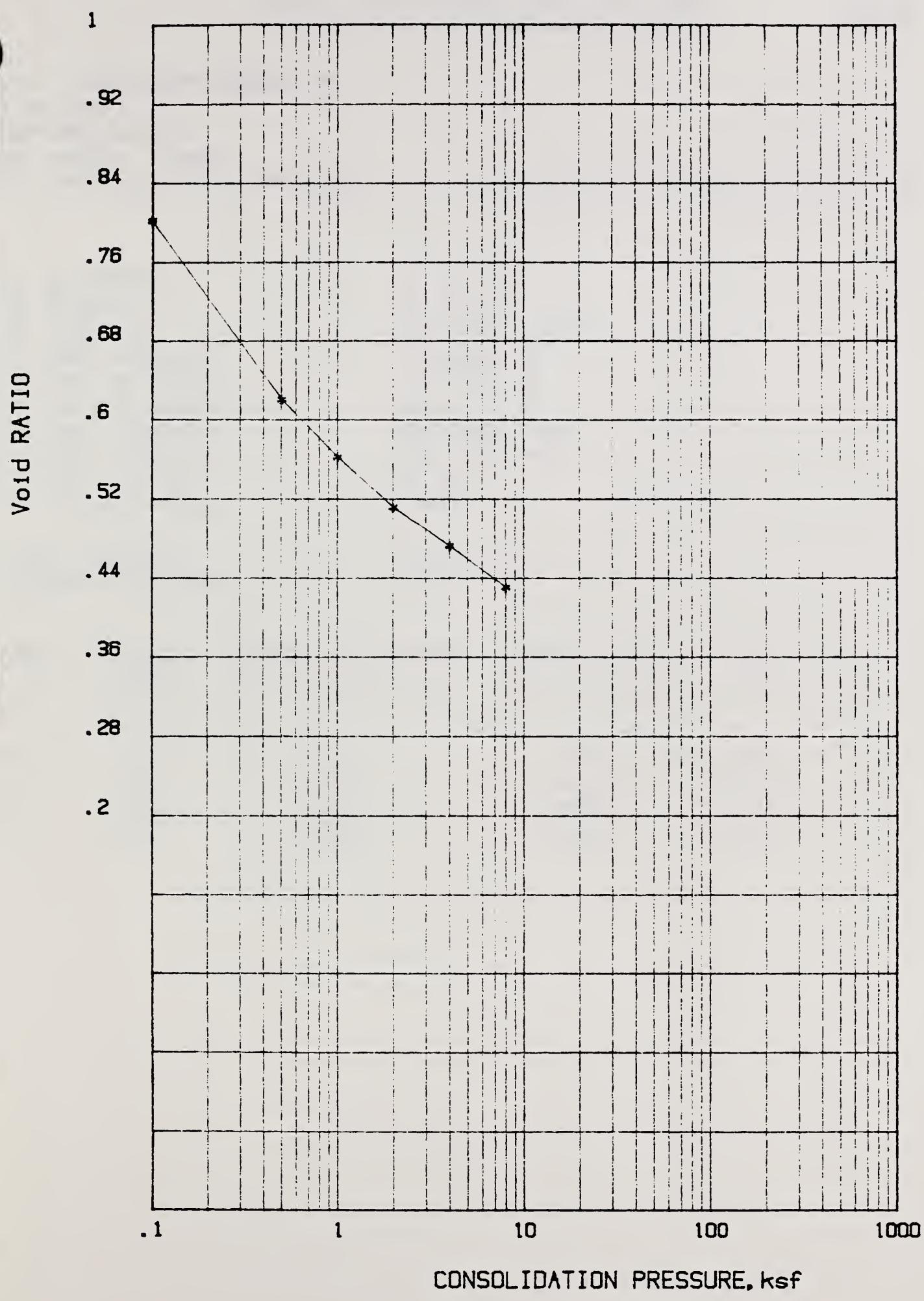
LAB. NUMBER 88C101

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.





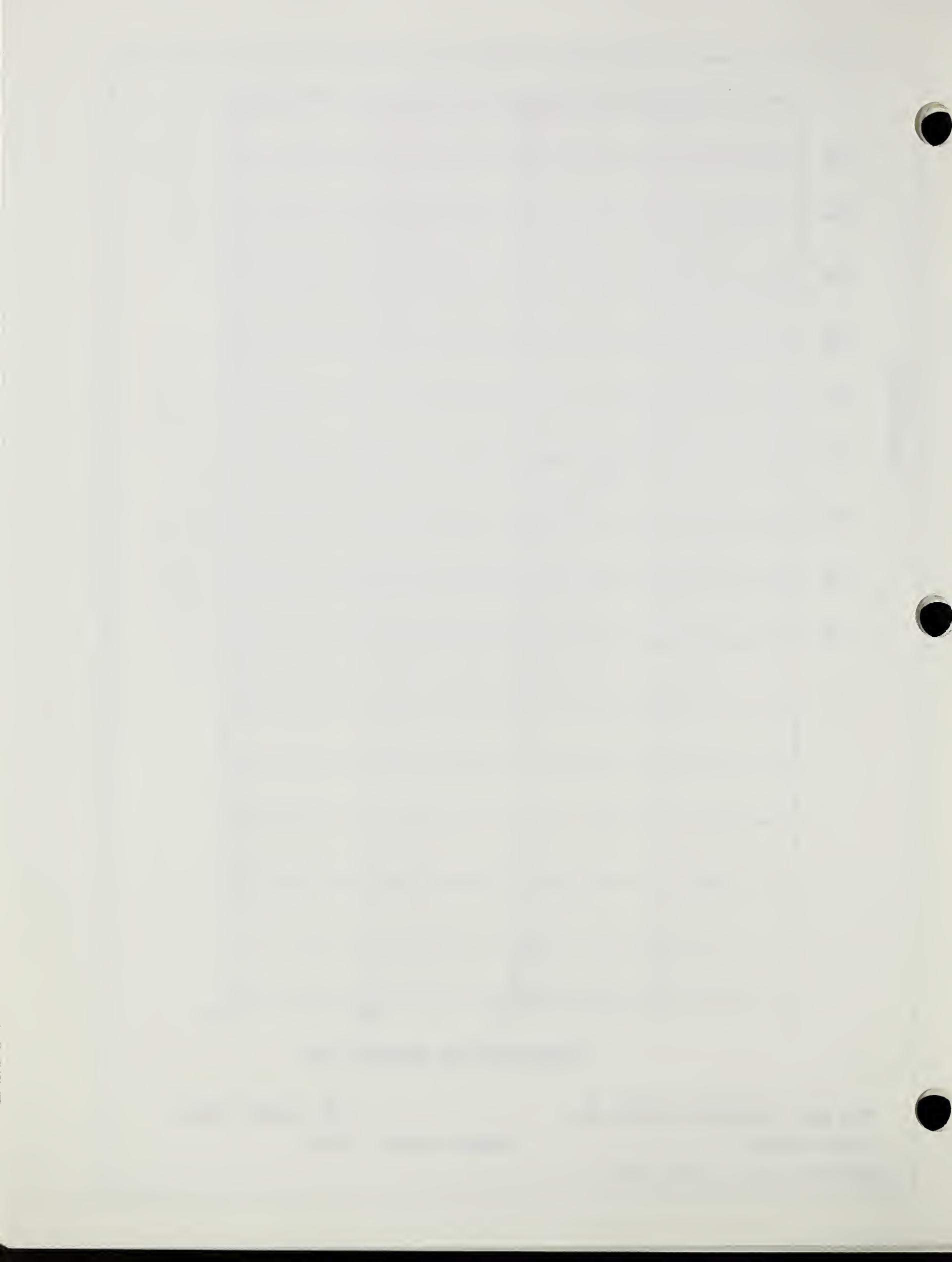
Project: SVERDRUP-MORRIS MN.

LAB. NUMBER 88C1D1

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



RESULTS OF CONSOLIDATION TEST
=====

Test 2

Project: SVERDROP-MORRIS MN

Field number:

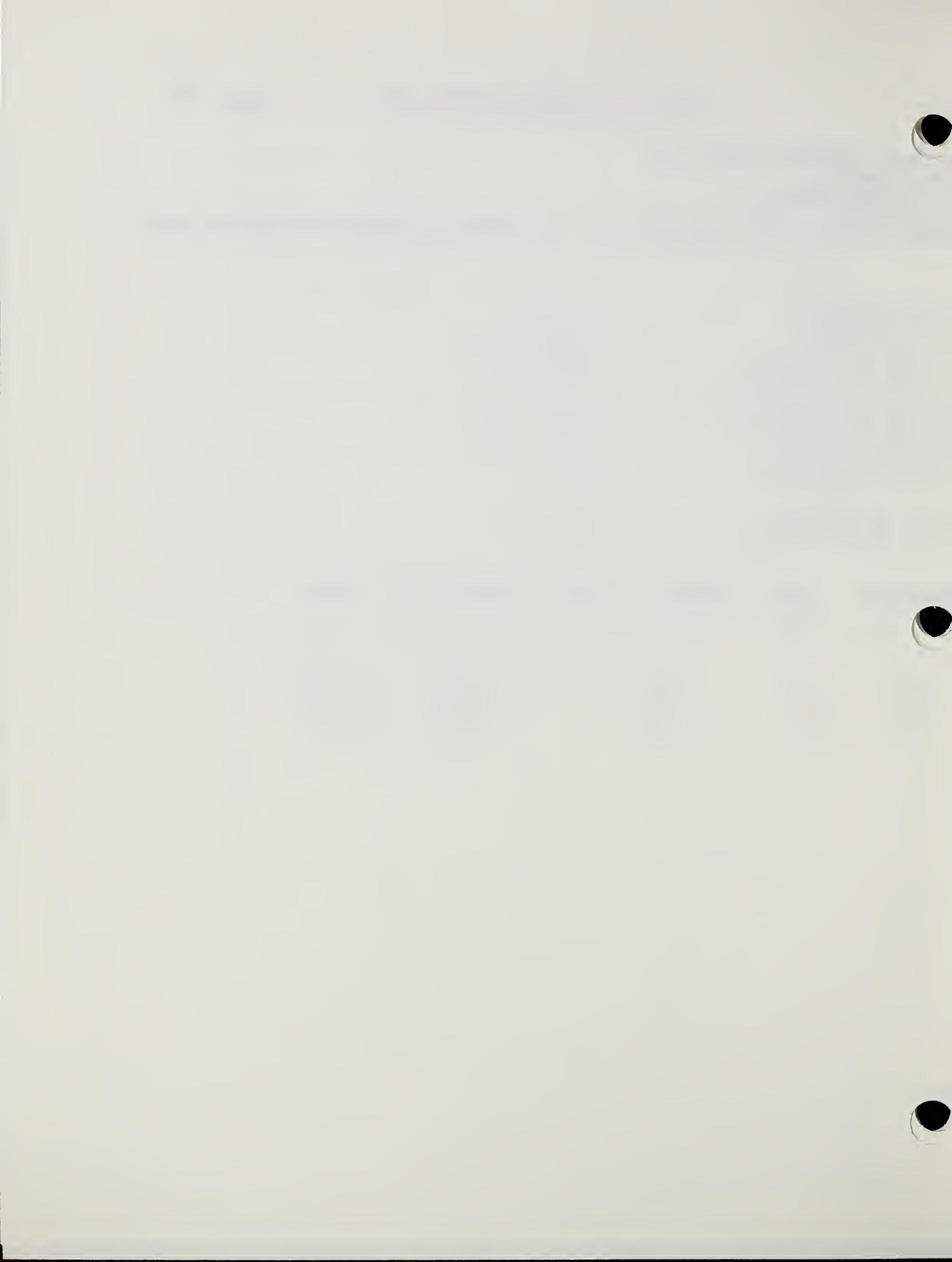
LAB.NUMBER 88C101

Sample depth: Feet

Sample description: COMPACTED TO 1.46 GMS/CC SATURATED AT START OF TEST

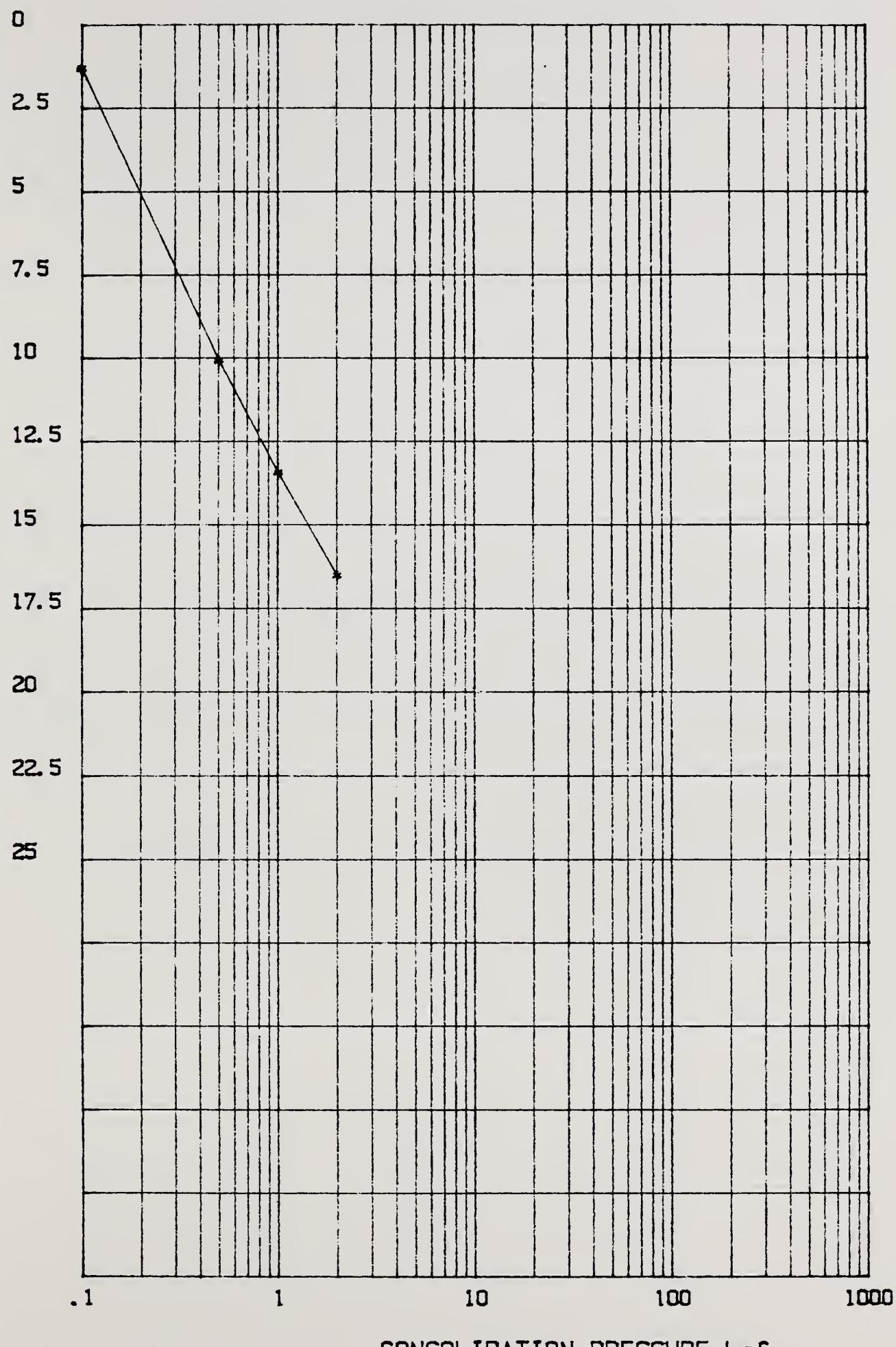
SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	123.55 g
INITIAL DRY WEIGHT:	117.44 g
INITIAL WATER CONTENT:	5.2 %
INITIAL WET DENSITY:	95.888 PCF
INITIAL DRY DENSITY:	91.146 PCF
SPECIFIC GRAVITY:	2.63
INITIAL VOID RATIO:	.801
FINAL WET WEIGHT:	139.69 g
FINAL WATER CONTENT:	18.9 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.0131	.7770	1.31
2.0	.50	.1009	.6190	10.09
3.0	1.00	.1346	.5580	13.46
4.0	2.00	.1655	.5030	16.55



Test 2

PERCENT CONSOLIDATION-LAB. SAMPLE.



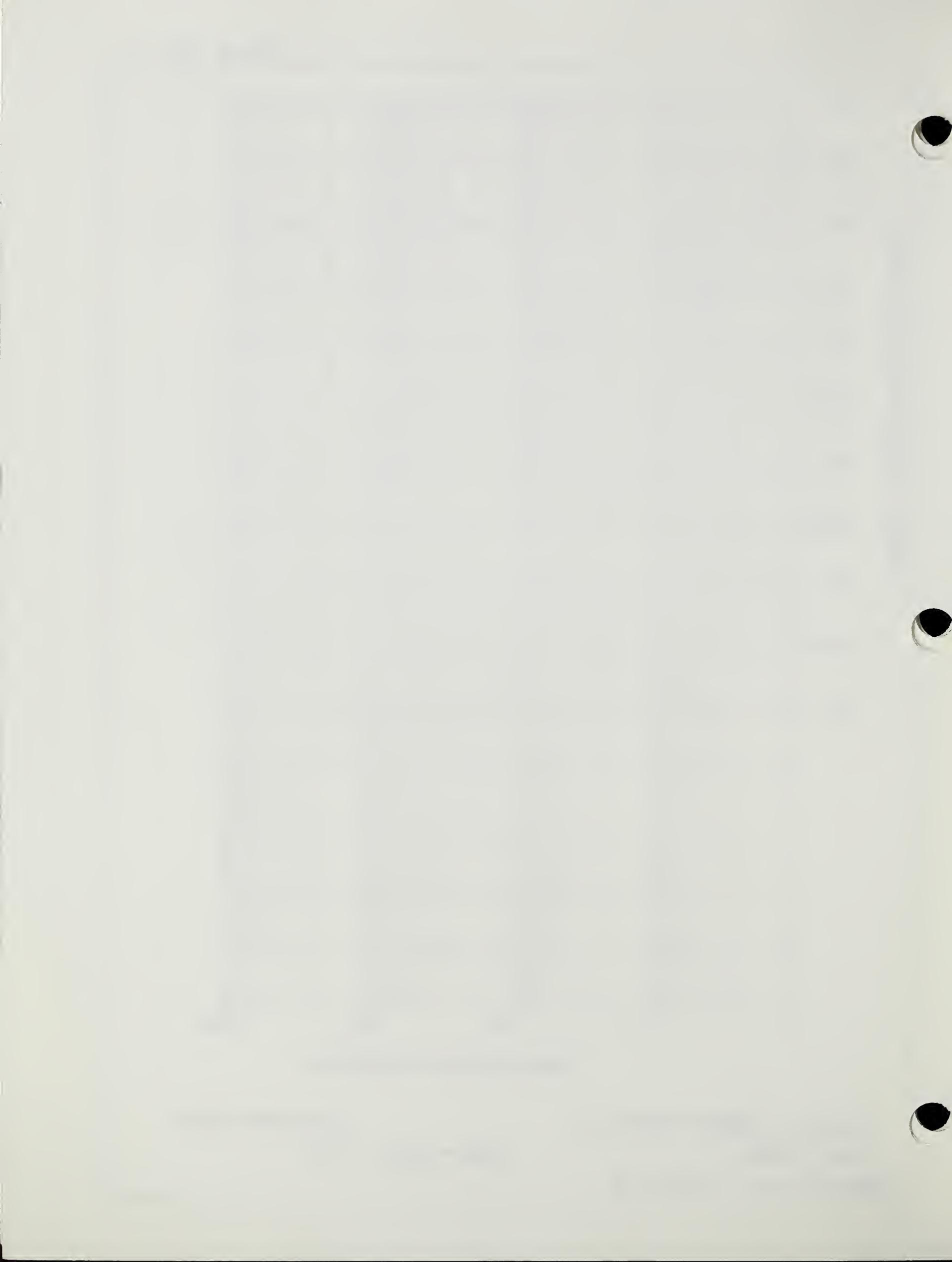
Project: SVERDROP-MDRRIS MN

LAB. NUMBER 88C1D1

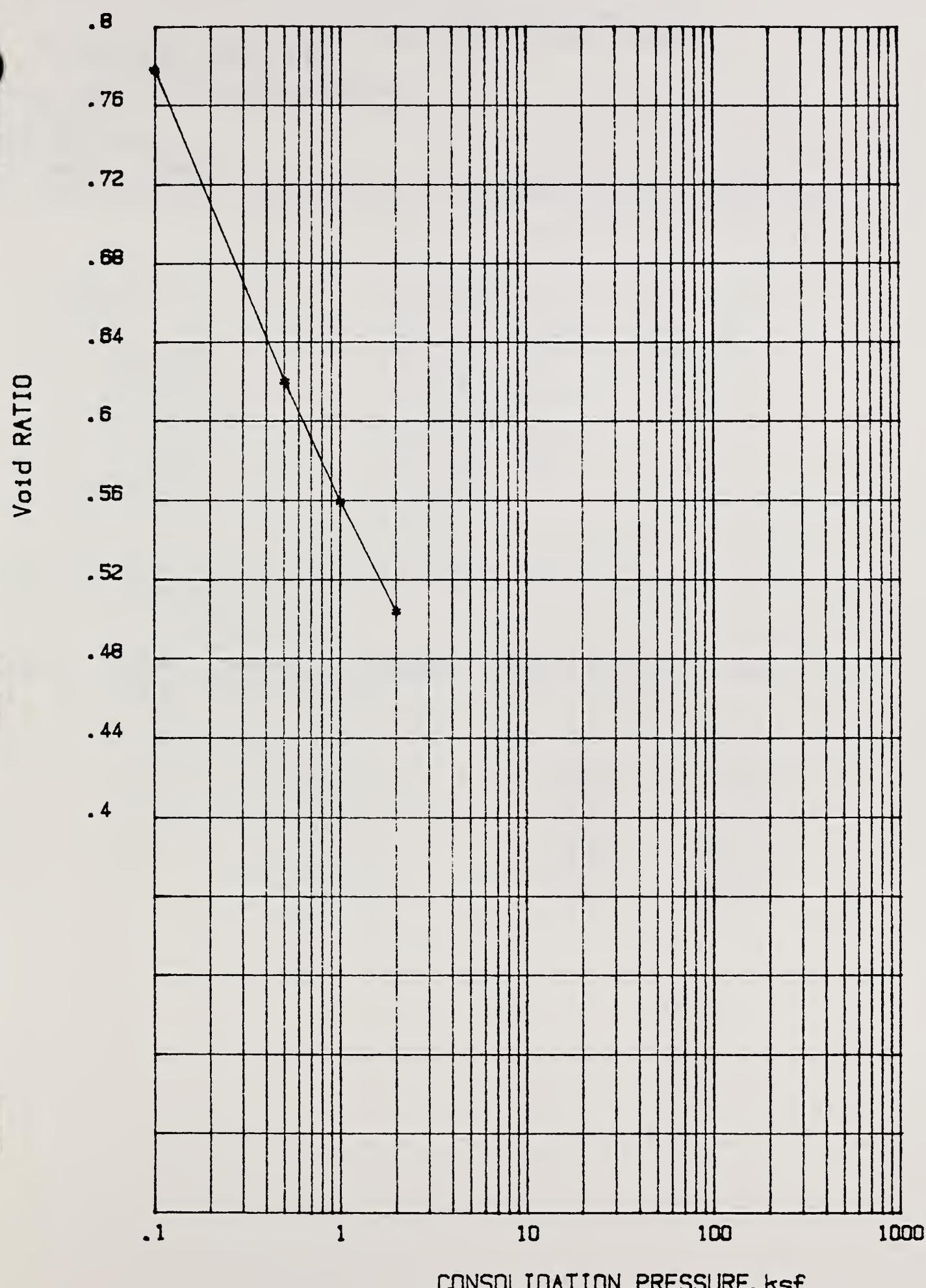
Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.

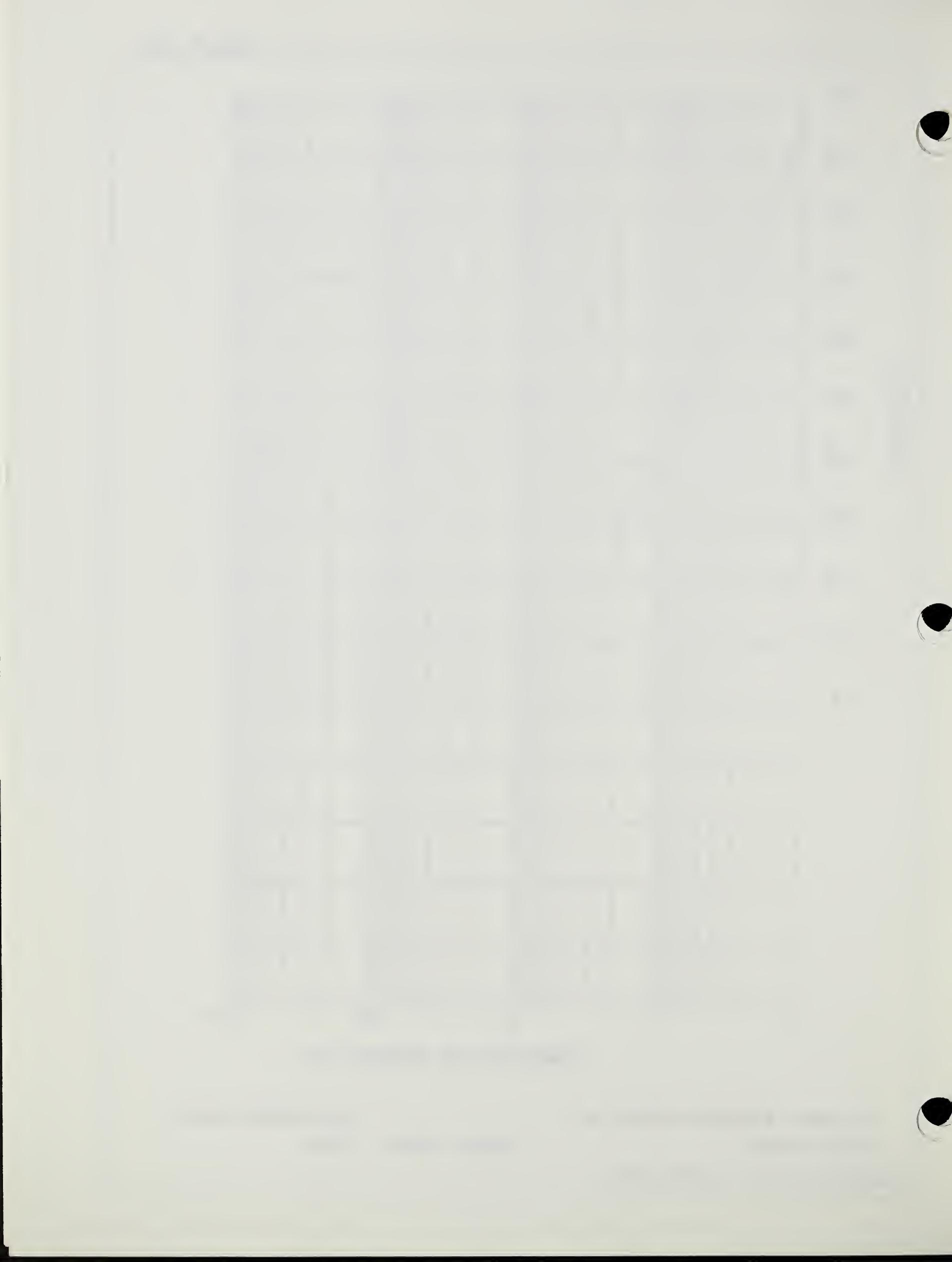


Test 3



Project: SVERDROP-MORRIS MN
Field number:
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C101
Sample depth: Feet



RESULTS OF CONSOLIDATION TEST

WEPP Sample

Project: WALLA WALLA-PULLMAN WA.

Field number:

LAB. NUMBER 88C102

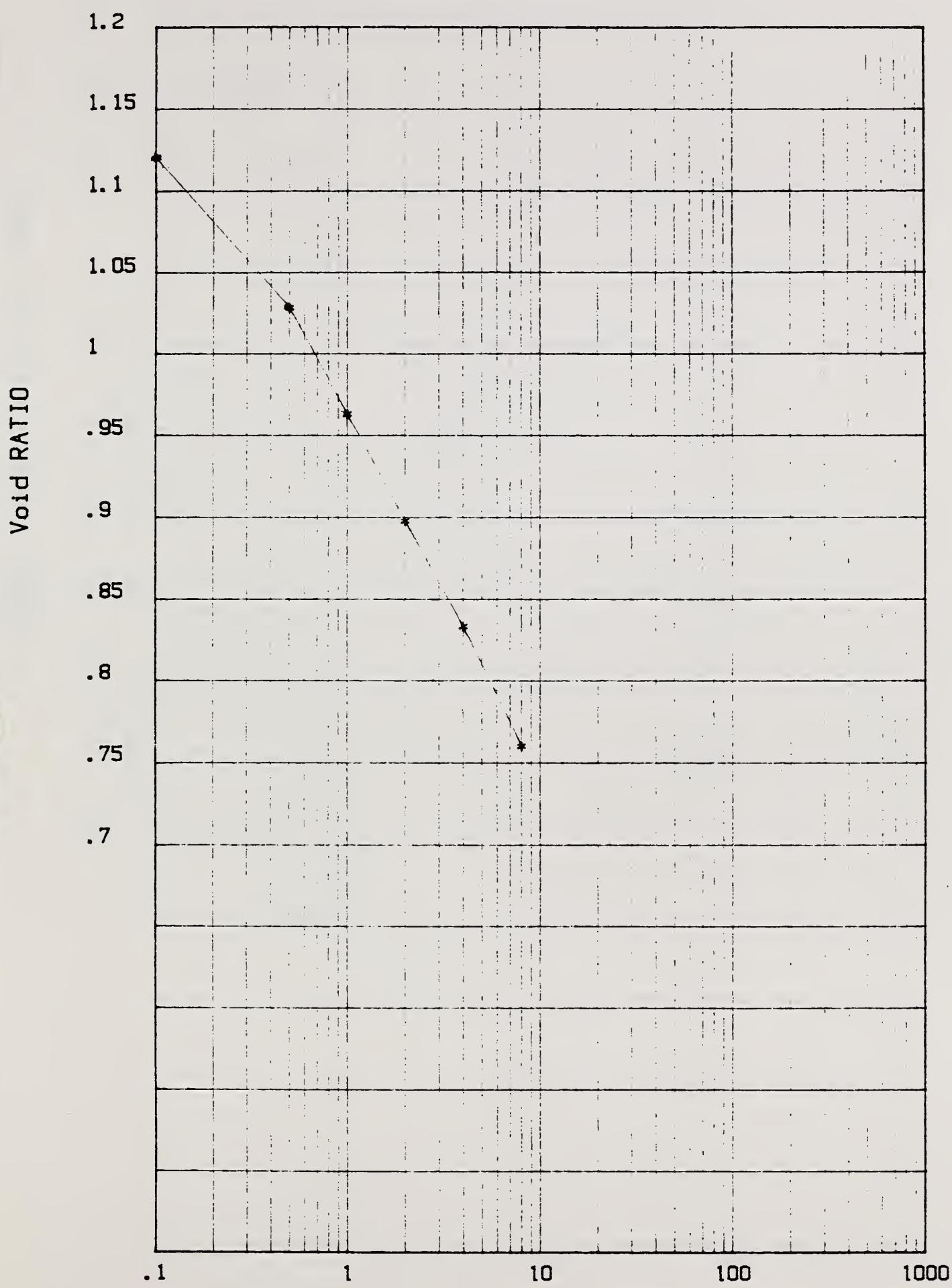
Sample depth: Feet

Sample description: COMPACTED TO 1.25 GM/CC CL/ML LL=38 PI=4

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	114.22 g
INITIAL DRY WEIGHT:	100.53 g
INITIAL WATER CONTENT:	13.6 %
INITIAL WET DENSITY:	88.647 PCF
INITIAL DRY DENSITY:	78.022 PCF
SPECIFIC GRAVITY:	2.65
INITIAL VOID RATIO:	1.12
FINAL WET WEIGHT:	131.72 g
FINAL WATER CONTENT:	31 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (in)	VOIDS RATIO	Su%
1.0	.10	.0000	1.1200	0.00
2.0	.50	.0435	1.0280	4.35
3.0	1.00	.0746	.9620	7.46
4.0	2.00	.1057	.8970	10.53
5.0	4.00	.1359	.8320	13.59
6.0	8.00	.1704	.7590	17.04

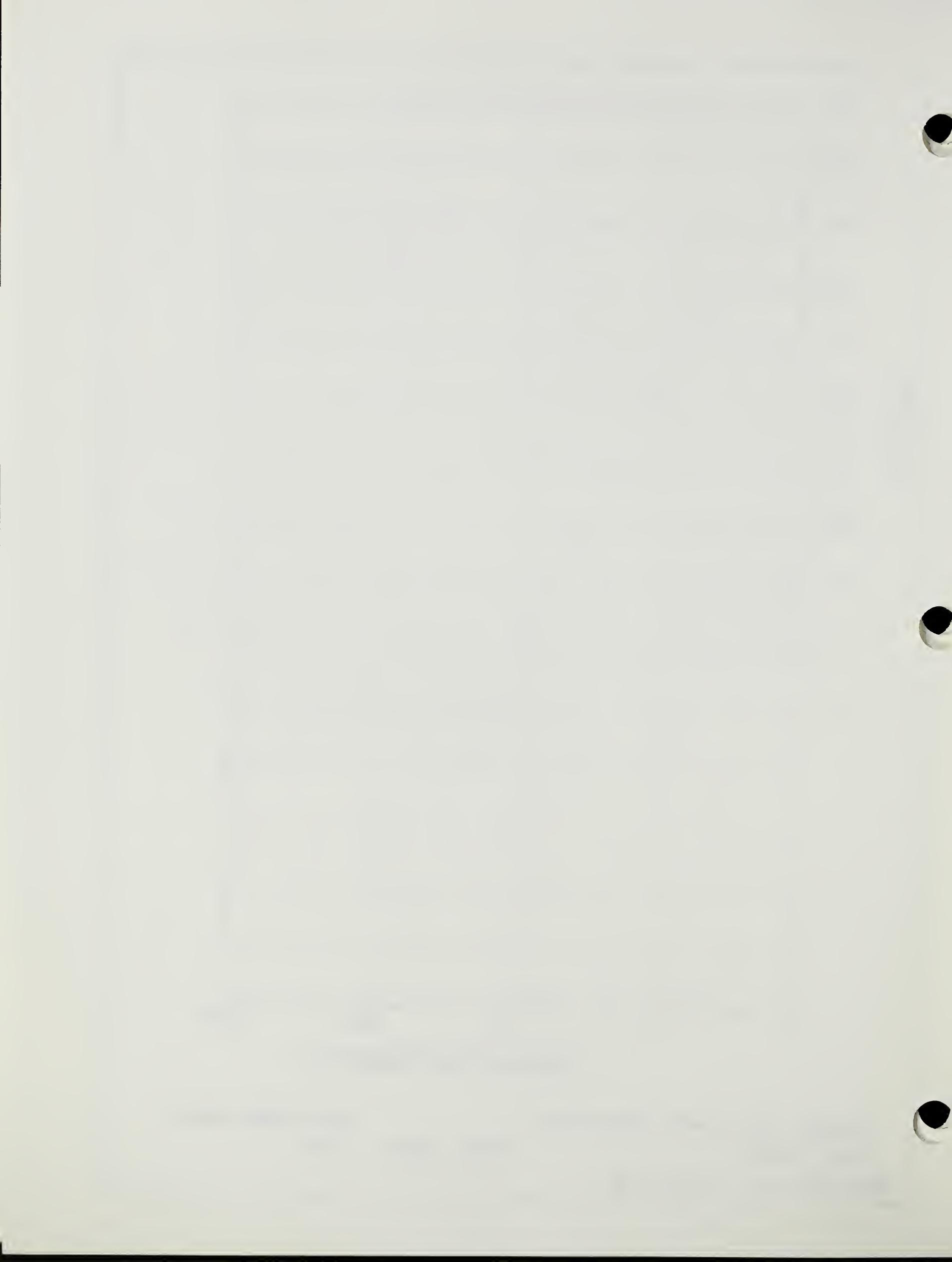




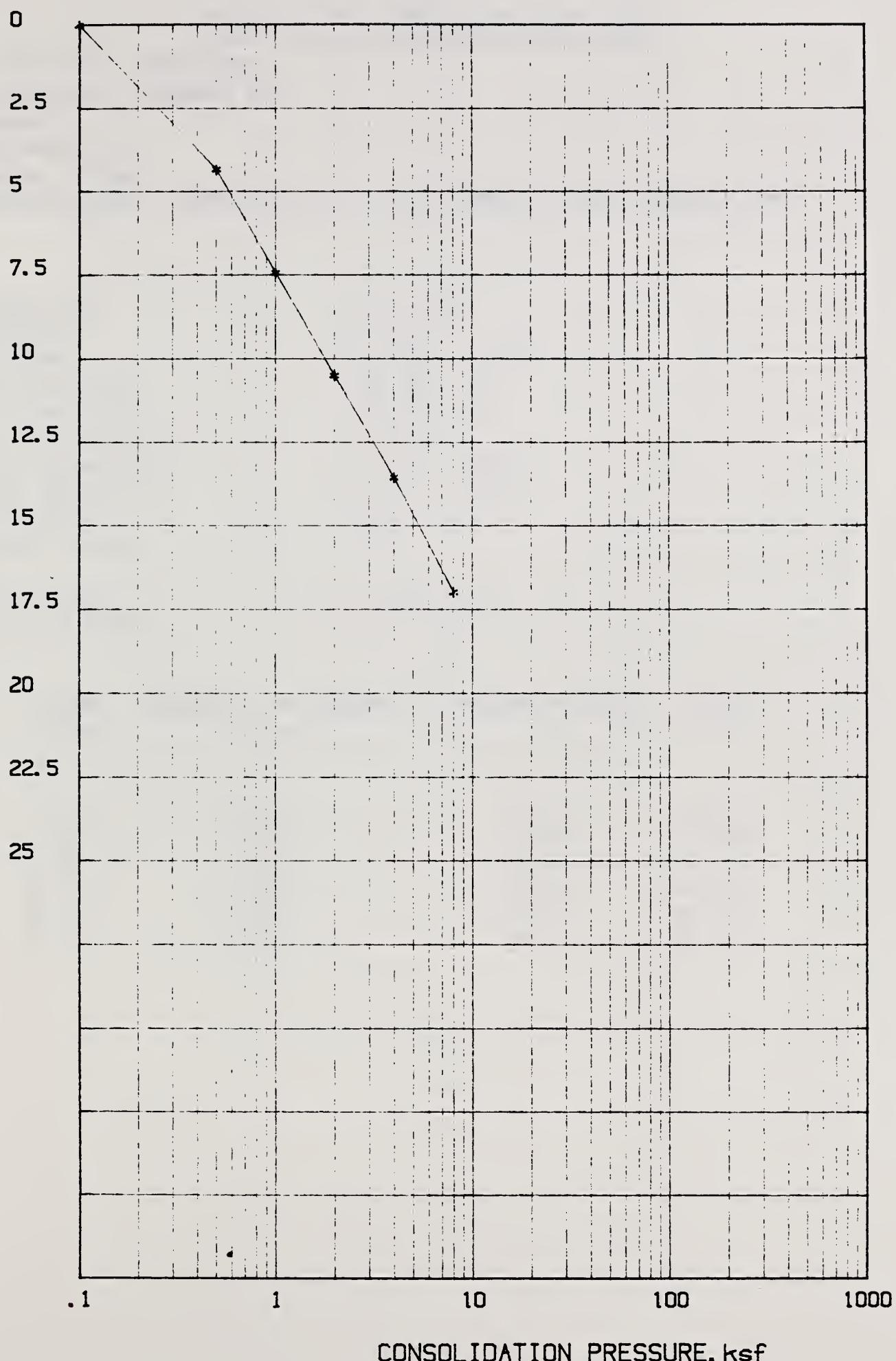
CONSOLIDATION PRESSURE, ksf

Project: WALLA WALLA-PULLMAN WA.
Field number:
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C102
Sample depth: Feet



PERCENT CONSOLIDATION-LAB. SAMPLE.



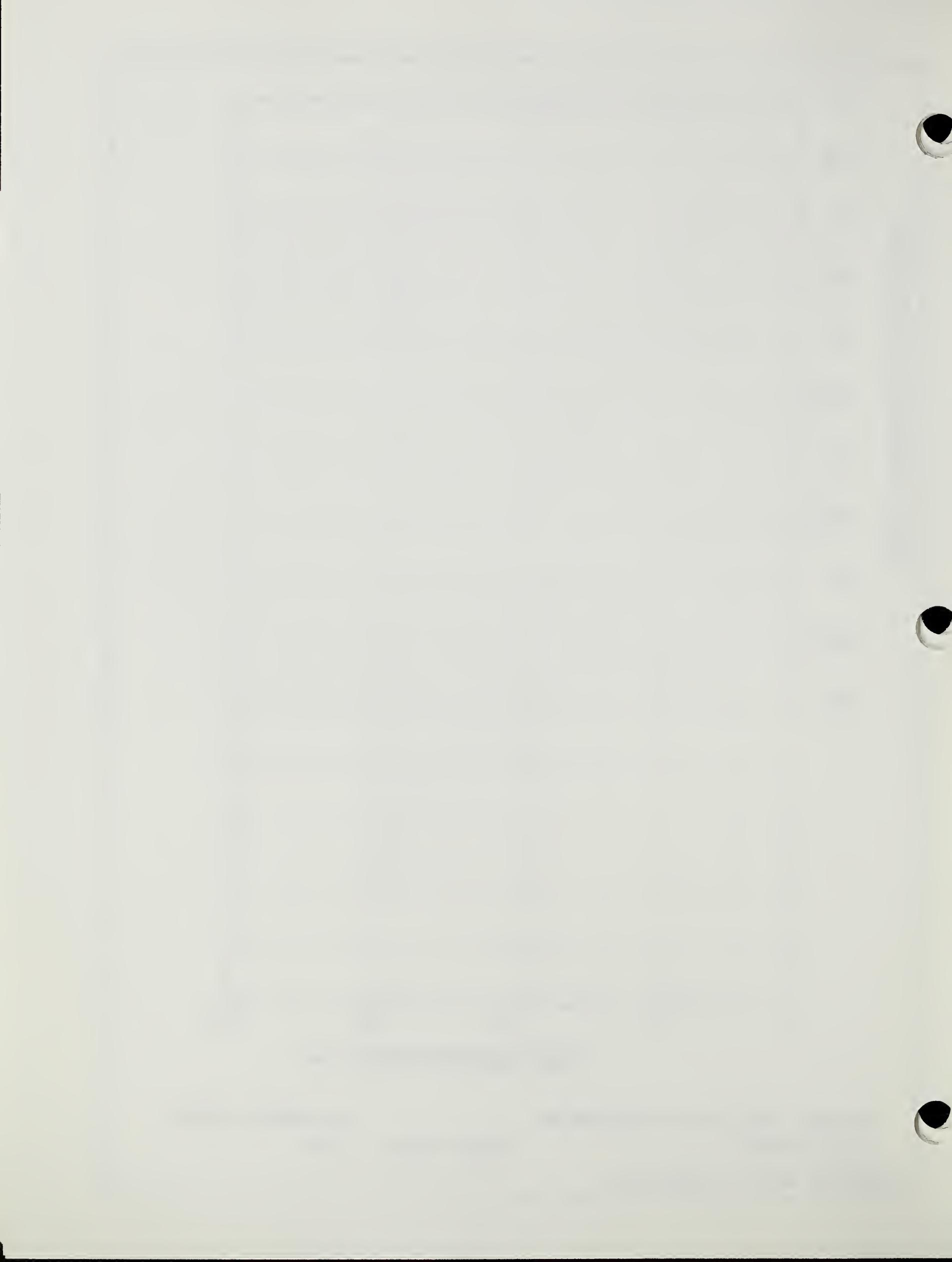
Project: WALLA WALLA-PULLMAN WA.

LAB. NUMBER 88C102

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



RESULTS OF CONSOLIDATION TEST

WEPP Sample

Project: WHITNEY--FRESNO CA.

Field number:

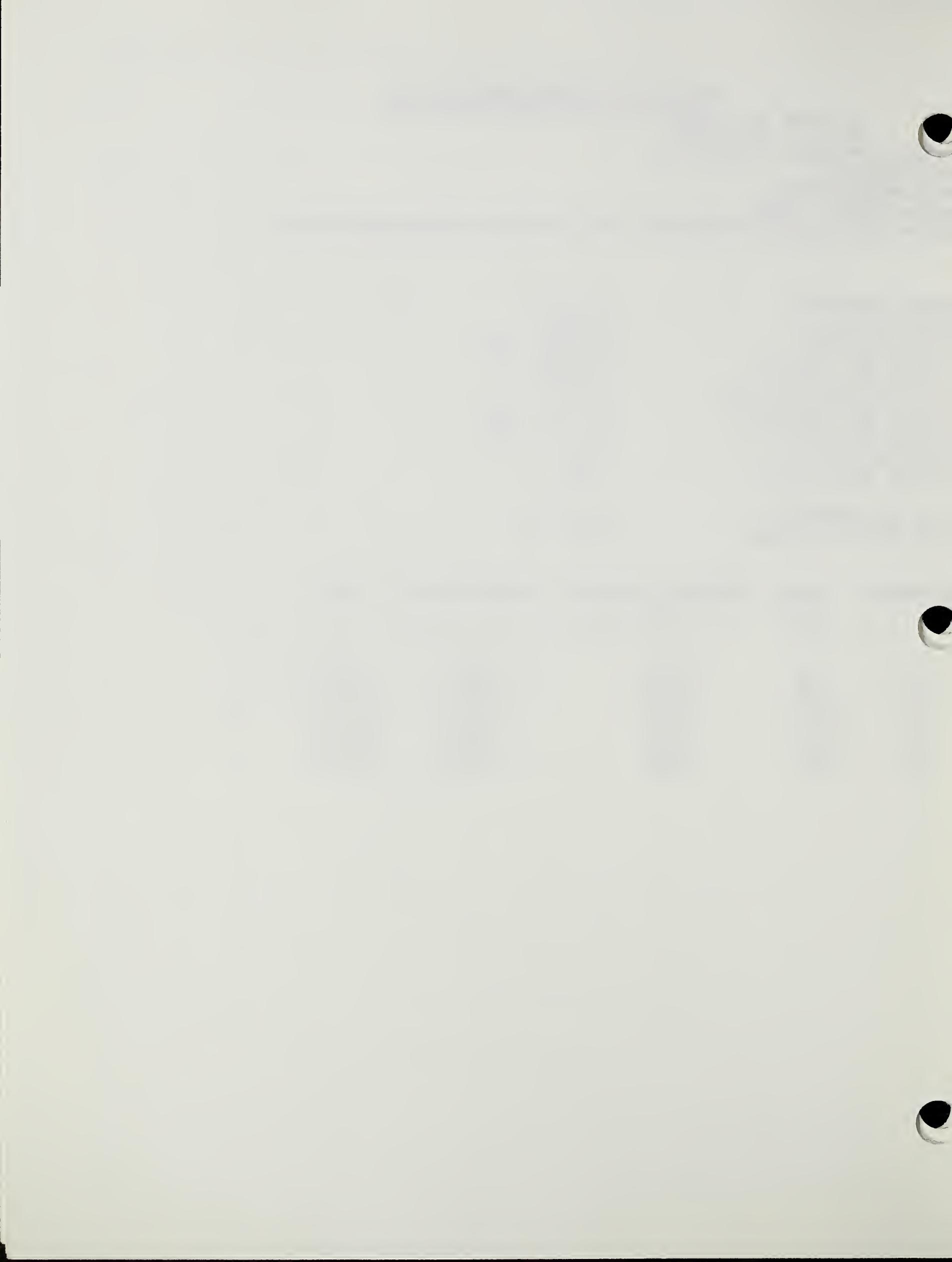
LAB. NUMBER 88C103

Sample depth: Feet

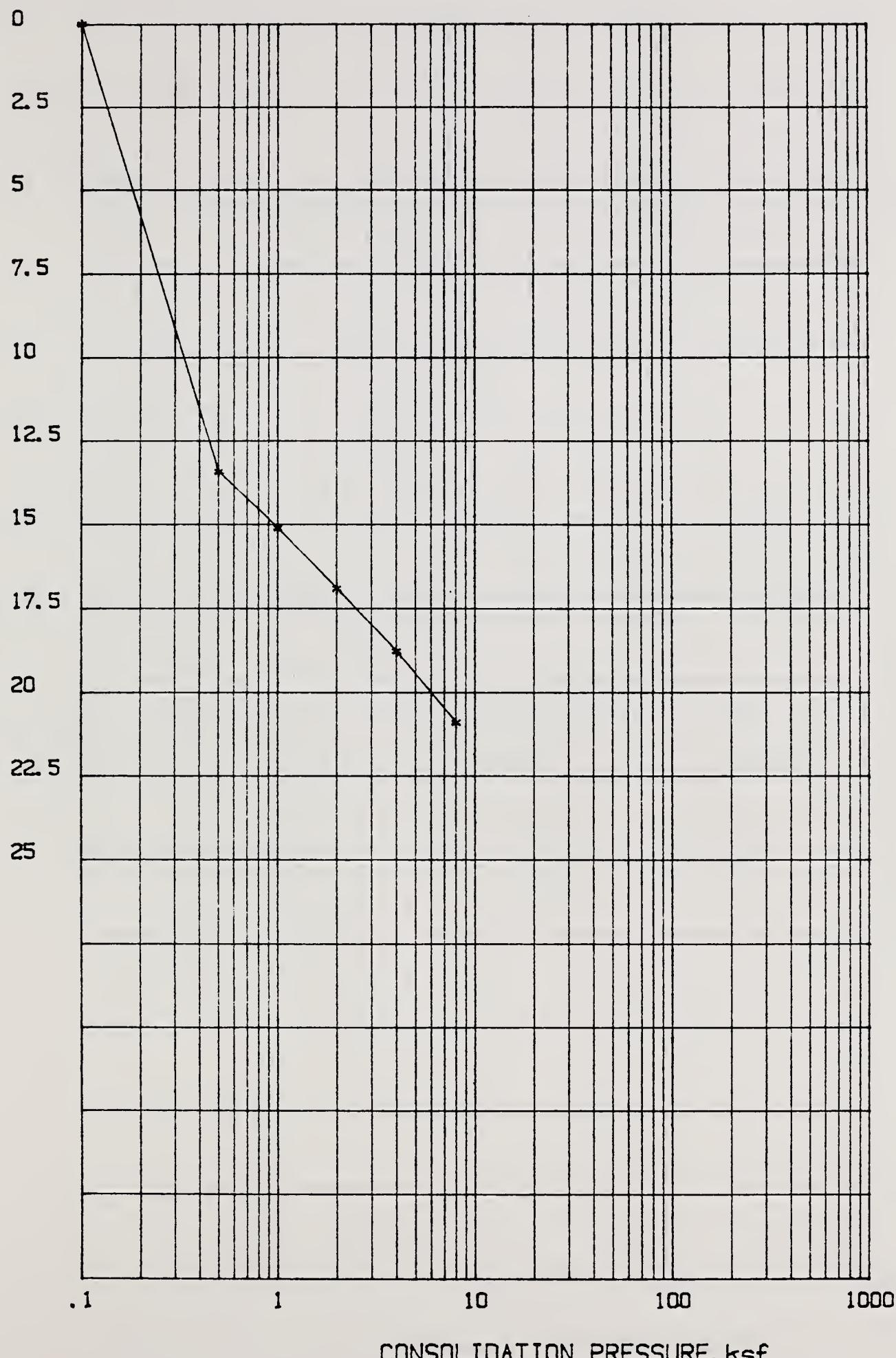
Sample description: COMPACTED TO 1.54 GMW/CC NON-PLASTIC SM

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	130.82 g
INITIAL DRY WEIGHT:	123.85 g
INITIAL WATER CONTENT:	5.6 %
INITIAL WET DENSITY:	101.53 PCF
INITIAL DRY DENSITY:	96.121 PCF
SPECIFIC GRAVITY:	2.67
INITIAL VOID RATIO:	.734
FINAL WET WEIGHT:	141.59 g
FINAL WATER CONTENT:	14.3 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	0.0000	.7340	0.00
2.0	.50	.1345	.5000	13.45
3.0	1.00	.1514	.4710	15.14
4.0	2.00	.1694	.4400	16.94
5.0	4.00	.1880	.4080	18.80
6.0	8.00	.2094	.3710	20.94

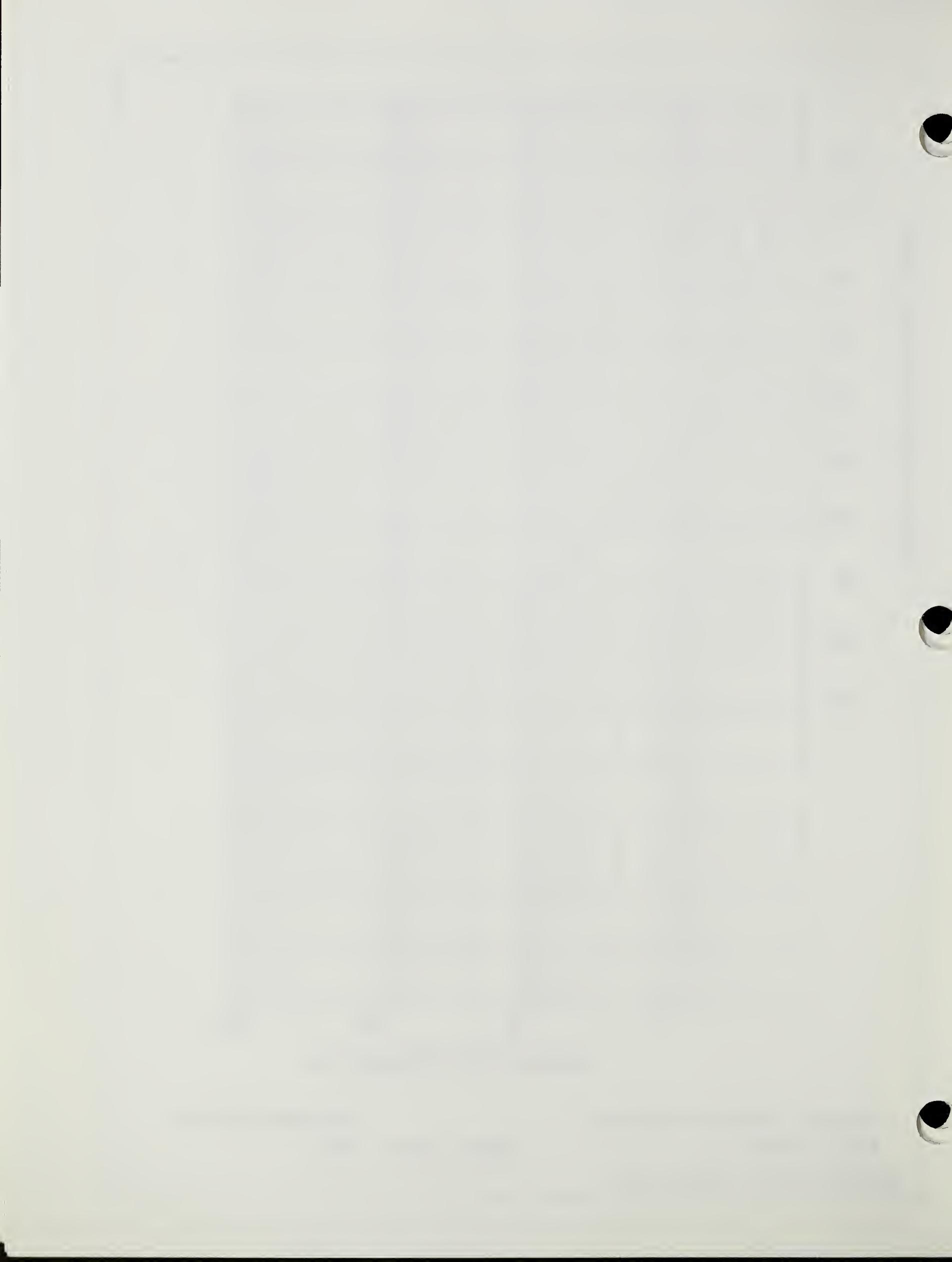


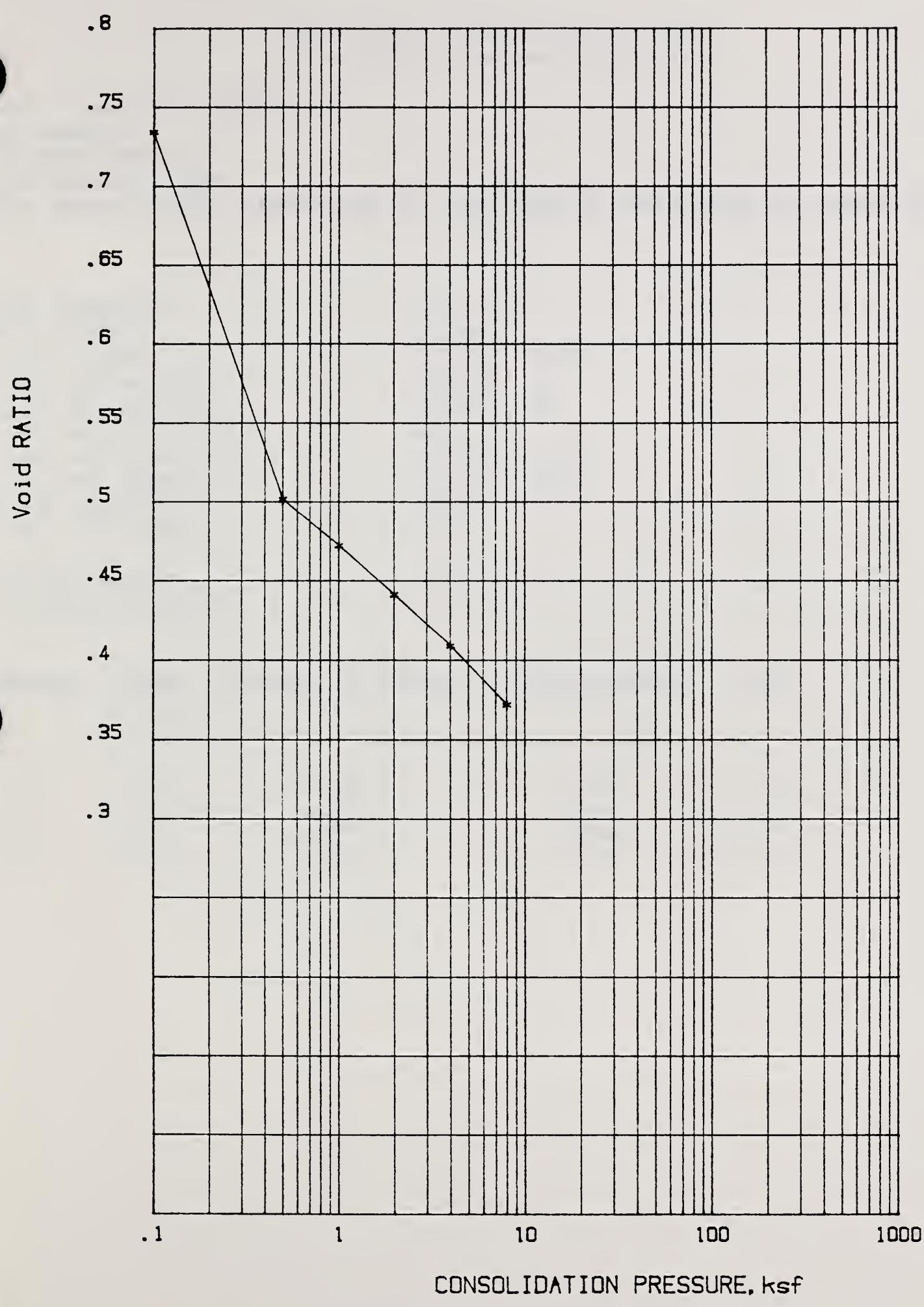
PERCENT CONSOLIDATION-LAB. SAMPLE.



Project: WHITNEY--FRESNO CA.
Field number:
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C103
Sample depth: Feet





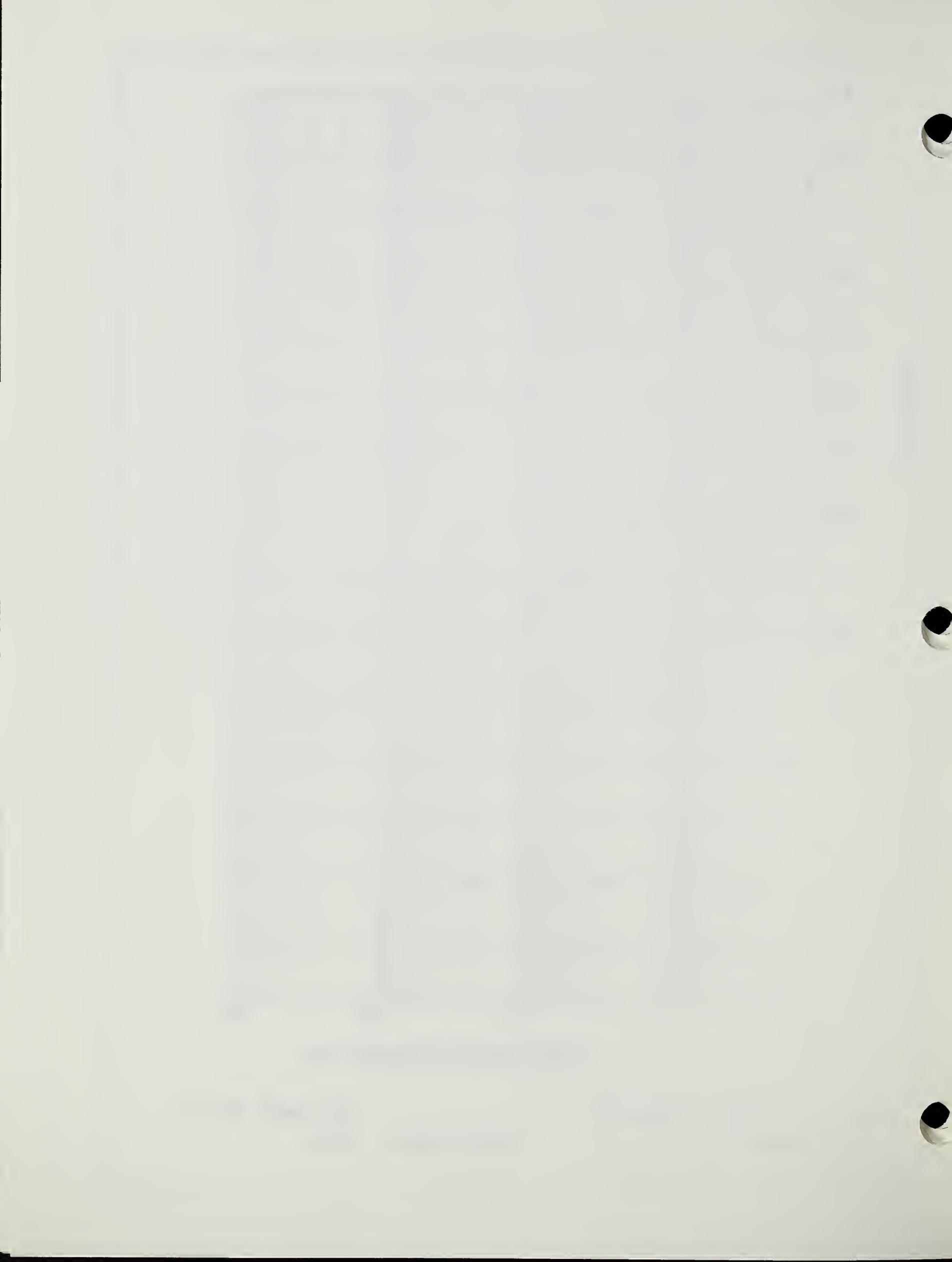
Project: WHITNEY--FRESNO CA.

LAB. NUMBER 88C103

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



Test 2

RESULTS OF CONSOLIDATION TEST

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Project: WHITNEY-FRESNO CA

Field number:

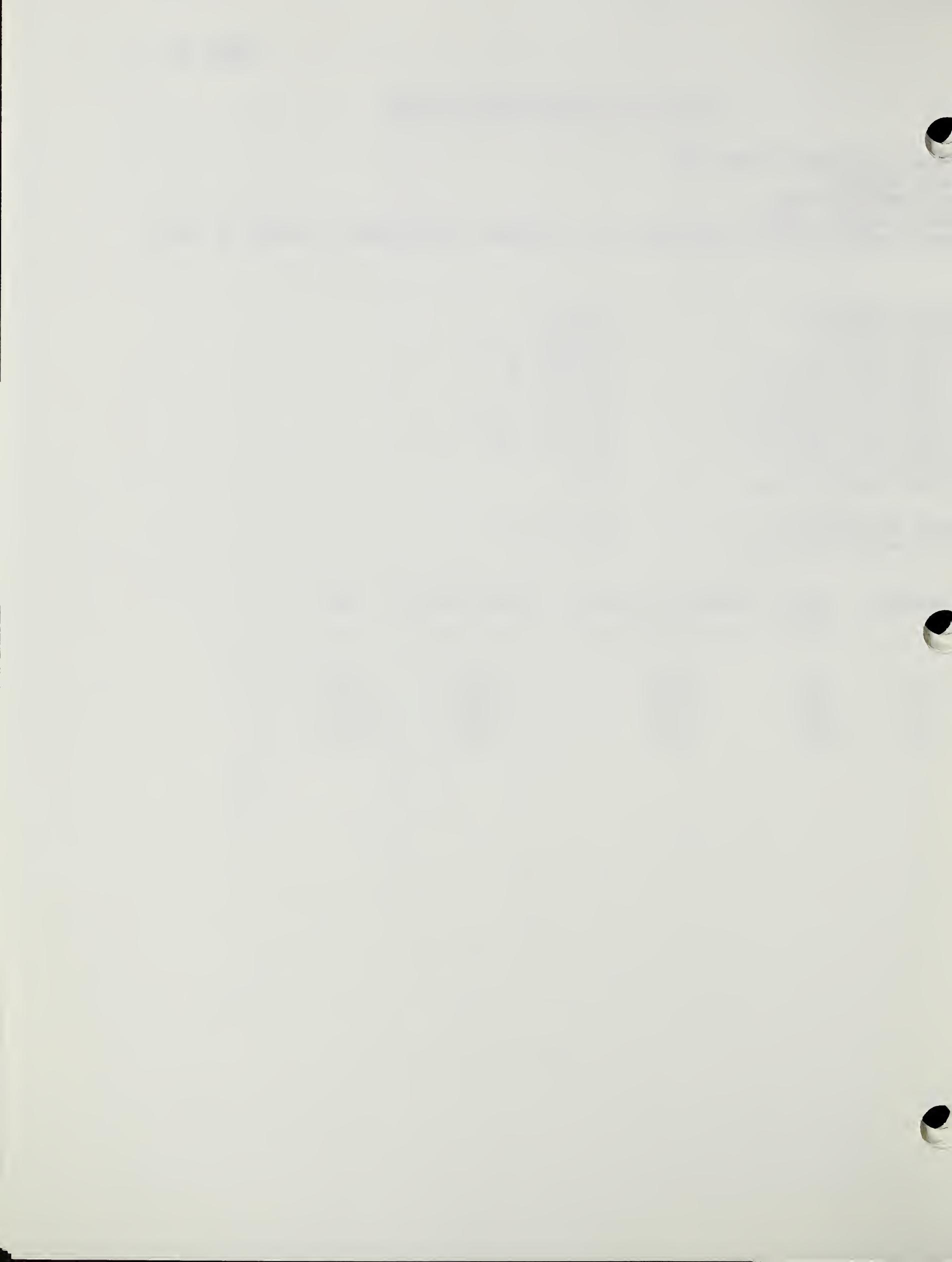
LAB. NUMBER 88C103

Sample depth: Feet

Sample description: COMPACTED TO 1.54 GMS/CC SATURATED AT START OF TEST

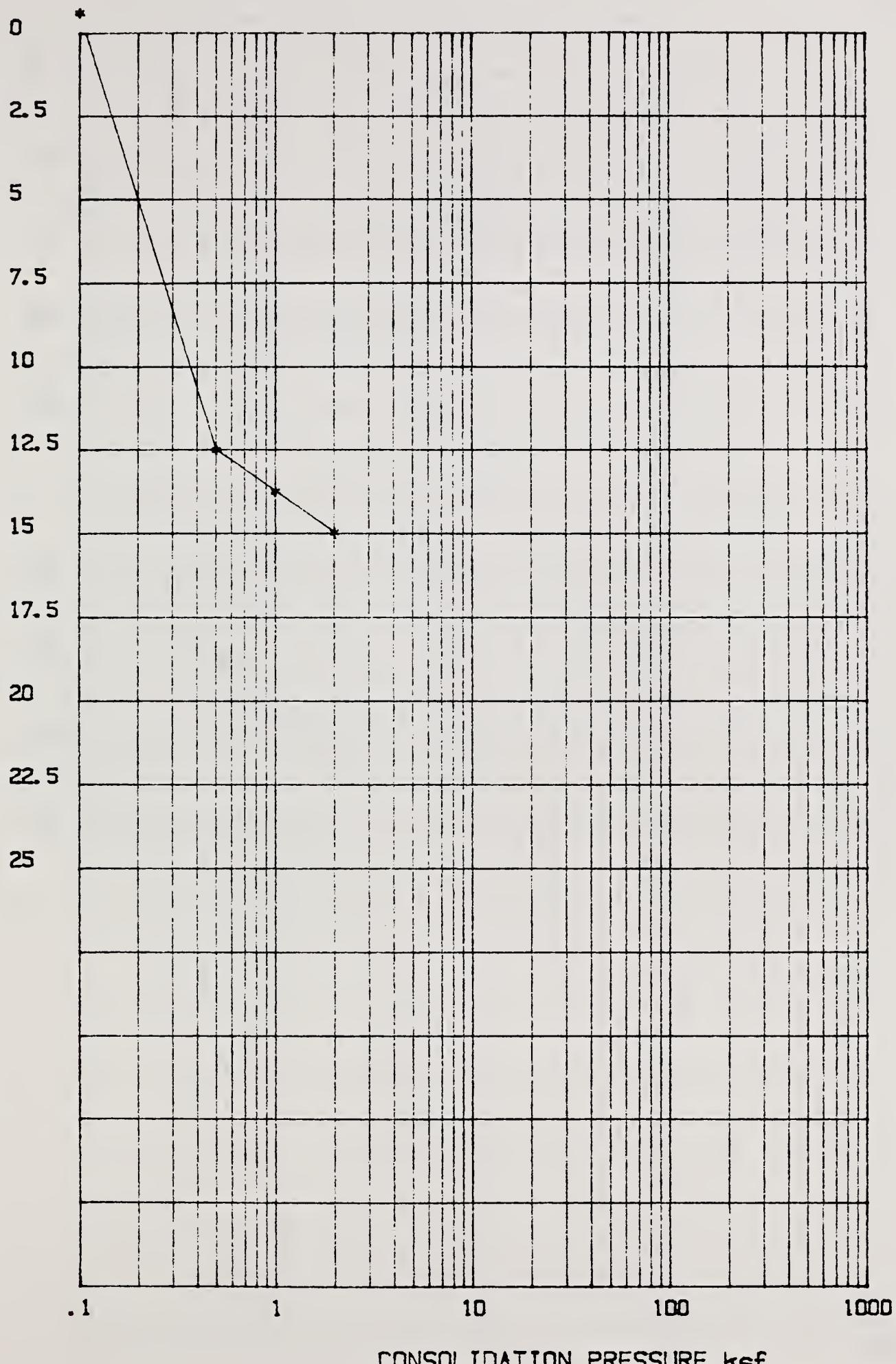
SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	134.07 g
INITIAL DRY WEIGHT:	123.87 g
INITIAL WATER CONTENT:	8.2 %
INITIAL WET DENSITY:	104.052 PCF
INITIAL DRY DENSITY:	96.136 PCF
SPECIFIC GRAVITY:	2.67
INITIAL VOID RATIO:	.733
FINAL WET WEIGHT:	142.73 g
FINAL WATER CONTENT:	15.2 %

INCREMENT -----	LOAD (ksf) -----	CHANGE IN HEIGHT (ins) -----	VOIDS RATIO -----	Su%
1.0	.10	-.0063	.7440	-.63
2.0	.50	.1252	.5160	12.52
3.0	1.00	.1377	.4950	13.77
4.0	2.00	.1500	.4730	15.00



Test 2

PERCENT CONSOLIDATION-LAB. SAMPLE.



Project: WHITNEY-FRESNO CA

Field number:

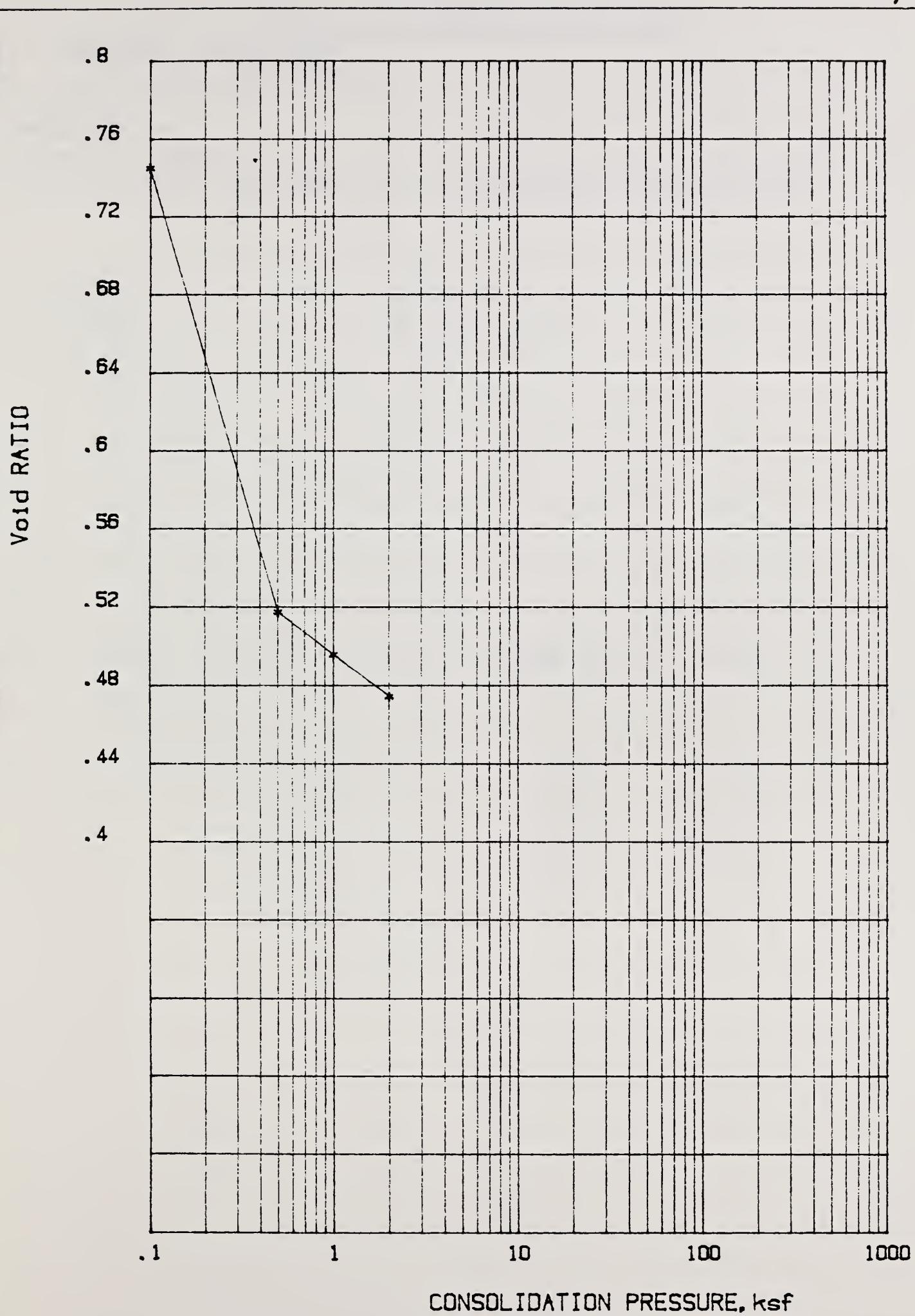
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C103

Sample depth: Feet

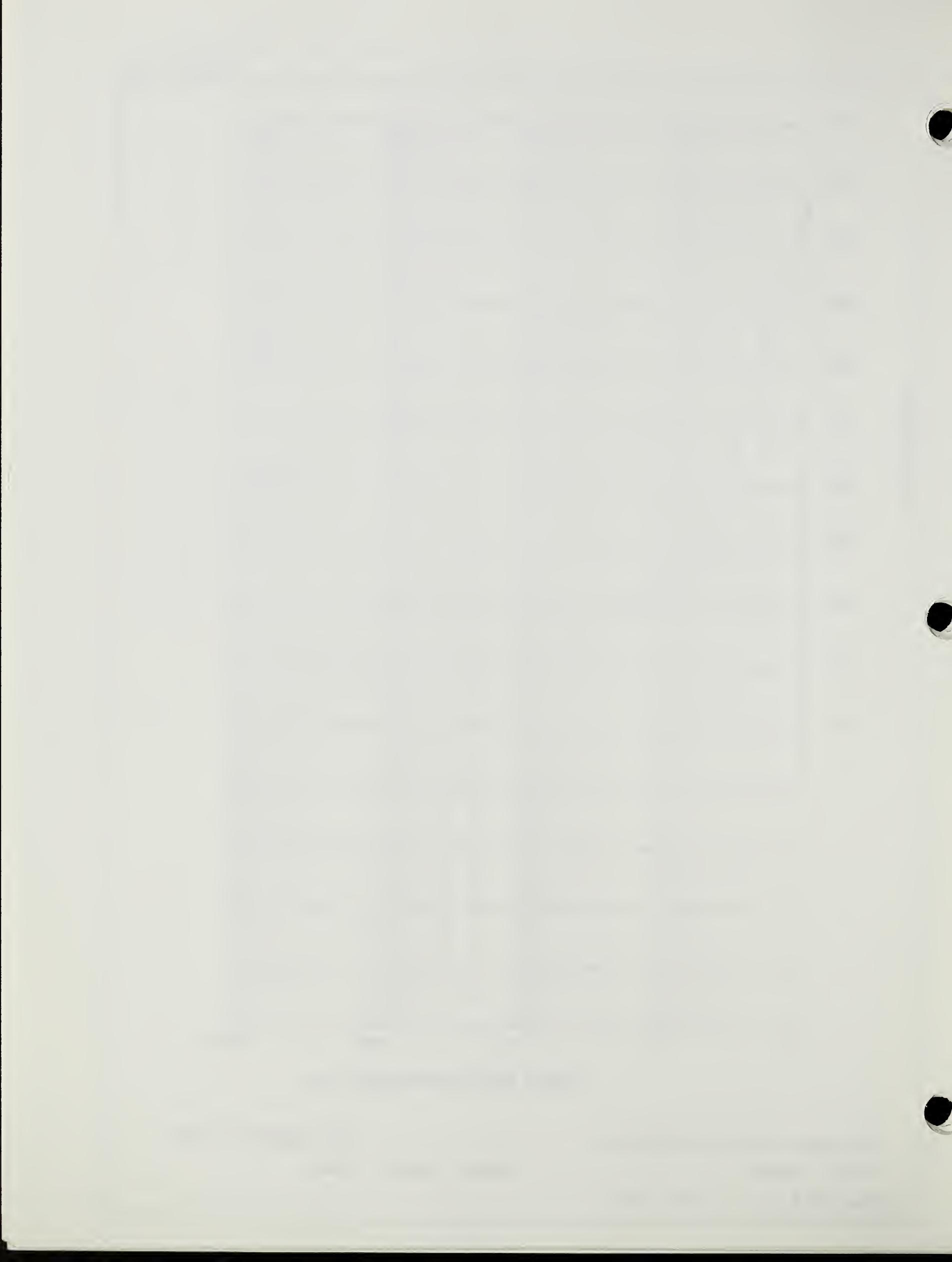


Test 2



Project: WHITNEY-FRESNO CA
Field number:
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C103
Sample depth: Feet



RESULTS OF CONSOLIDATION TEST

WEPP - Sample

Project: WILLIAMS- MCGLUSKY ND.

Field number:

LAB. NUMBER 88C104

Sample depth: Feet

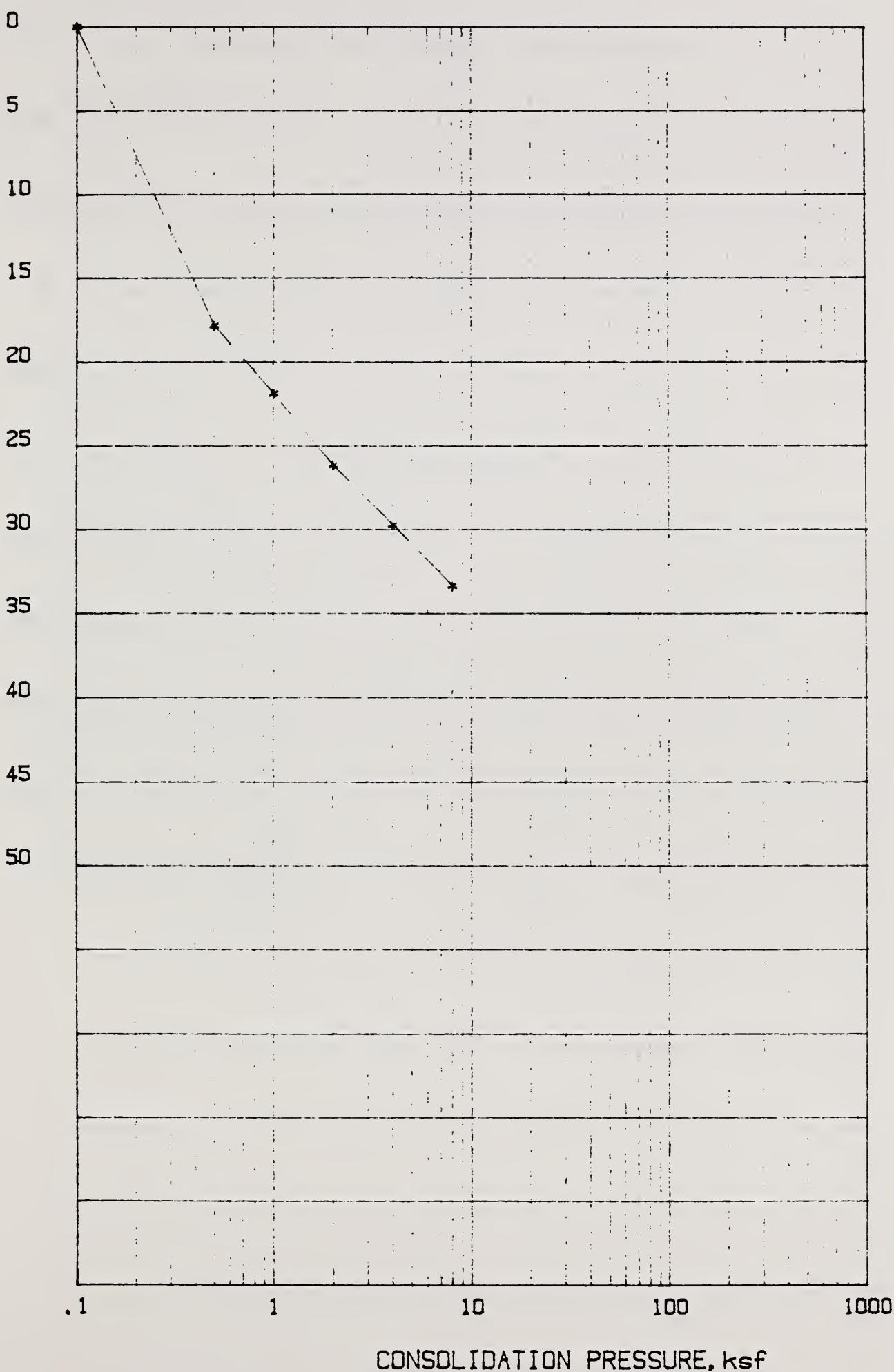
Sample description: REMOLDED TO 1.16 GMS/CC CL LL=37 PI=19

SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	106.99 g
INITIAL DRY WEIGHT:	93.3 g
INITIAL WATER CONTENT:	14.4 %
INITIAL DRY UNIT WEIGHT:	97.035 PDD
INITIAL PORE PRESSURE:	72.41 PDP
APPARENT DENSITY:	2.59
INITIAL APPARENT void ratio:	1.233
FINAL APPARENT void ratio:	0.97
FINAL DRY UNIT WEIGHT:	104.9 g/cm ³

INCREMENT	LOAD	CHANGE IN HEIGHT	VOIDS RATIO	Su%
1	10	0.0	1.2330	0.00
2	20	0.0	1.0370	17.86
3	30	-0.007	0.7430	21.93
4	40	-0.014	0.4470	26.20
5	50	-0.021	0.1560	29.76
6	60	-0.027	-0.4960	33.43



PERCENT CONSOLIDATION-LAB. SAMPLE.



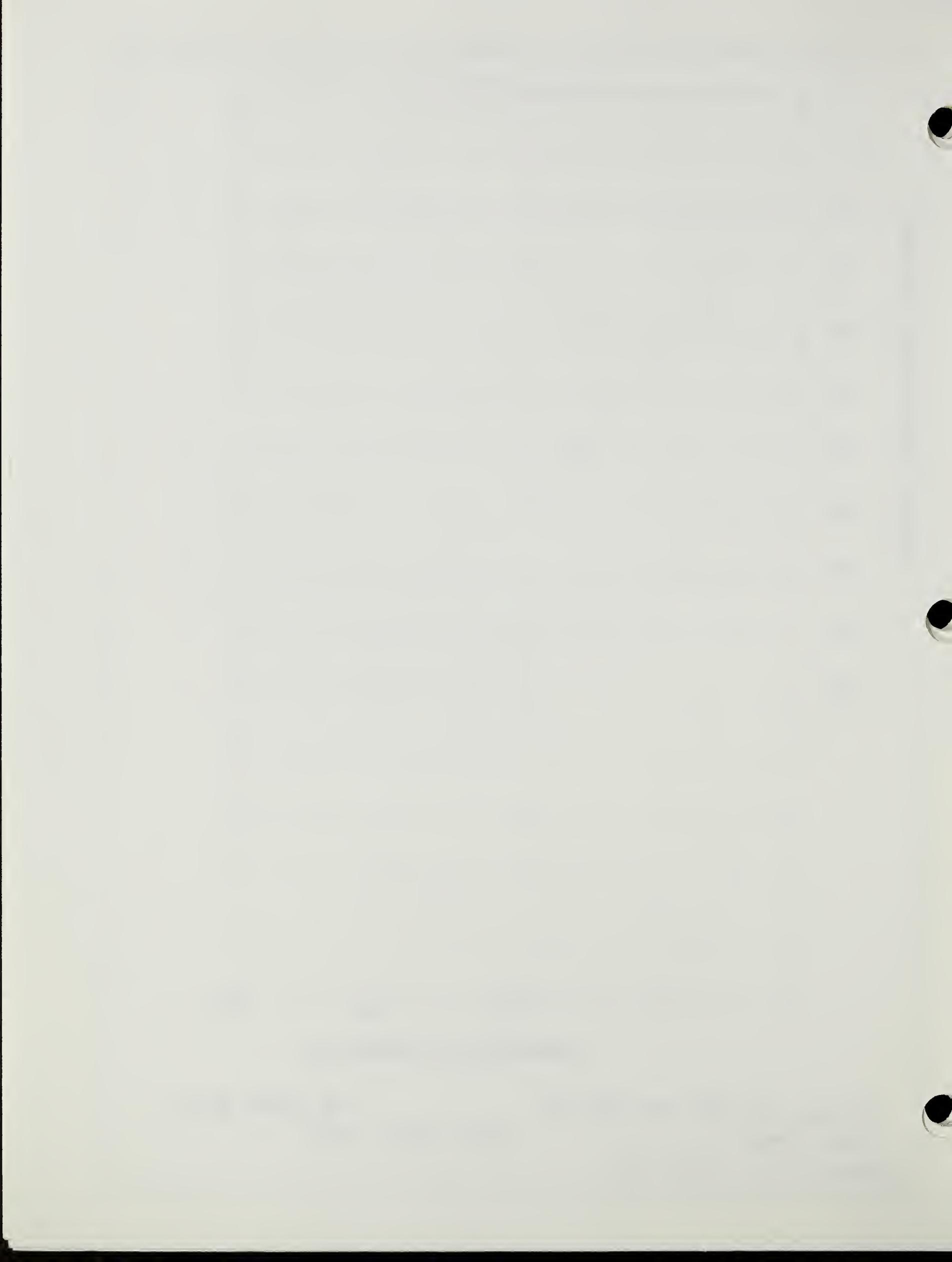
Project: WILLIAMS- McCLUSKY ND.

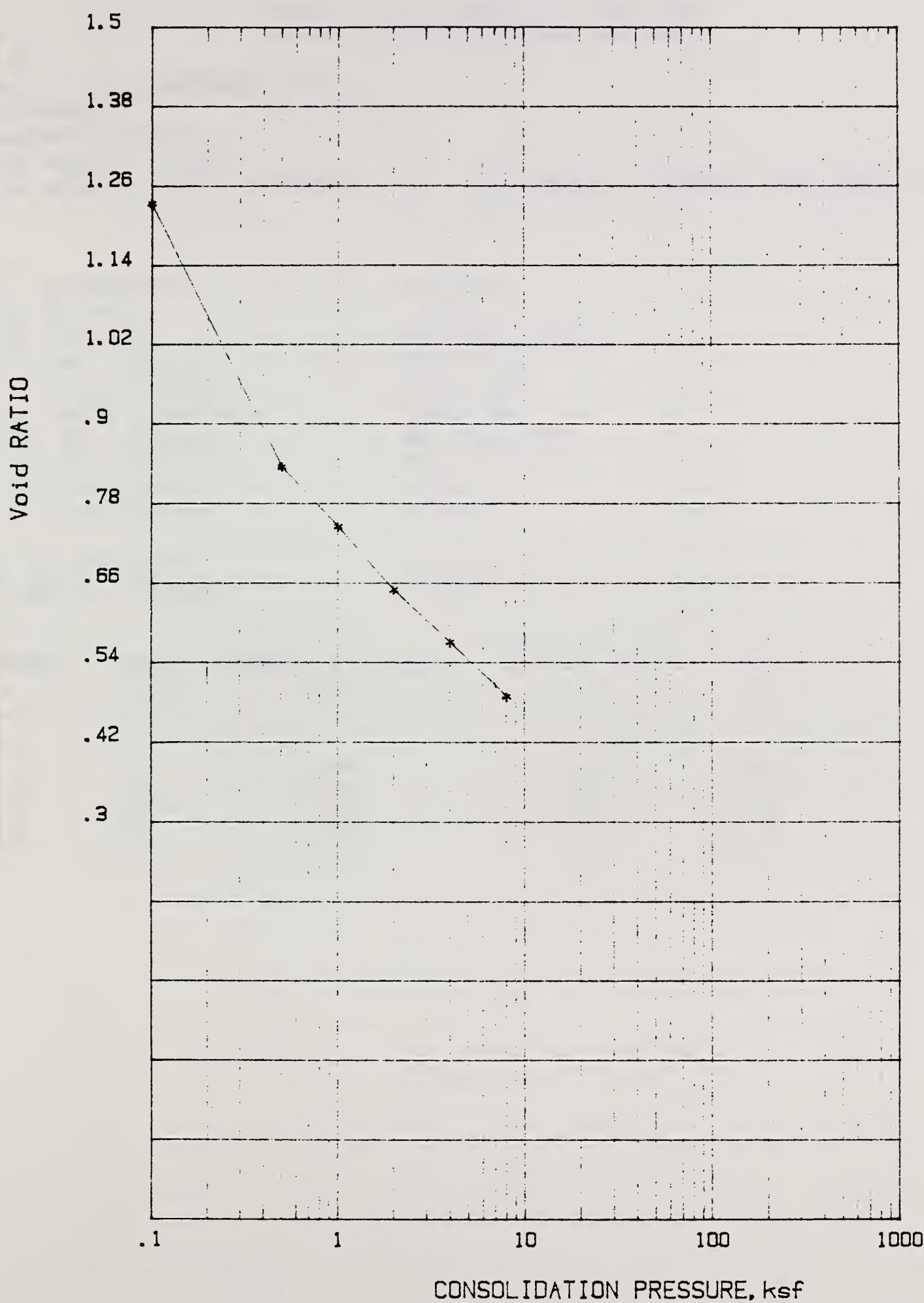
LAB. NUMBER 88C104

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.





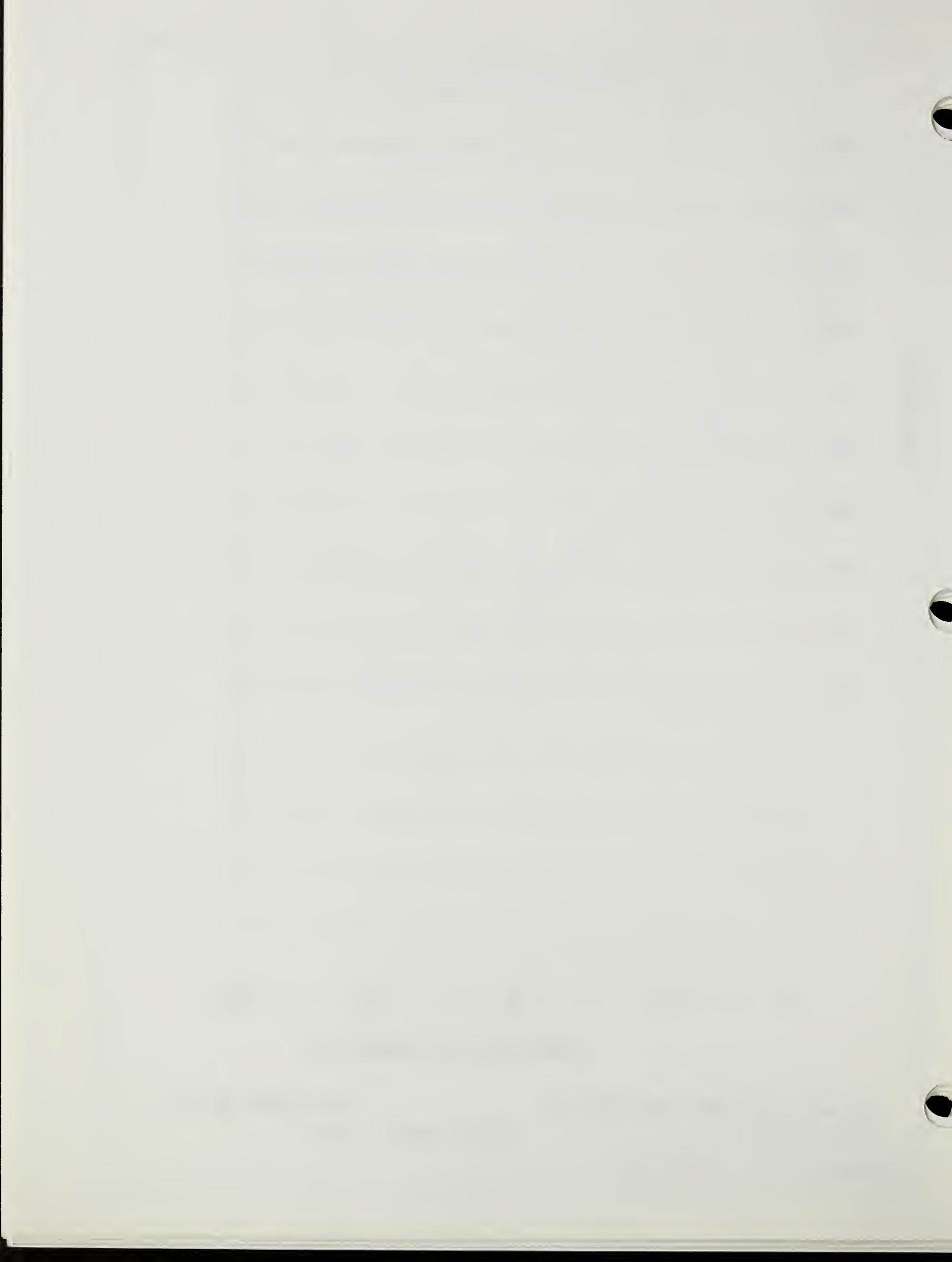
Project: WILLIAMS- McCLUSKY ND.

LAB. NUMBER 88C104

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



Test 2

RESULTS OF CONSOLIDATION TEST

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Project: WILLIAMS-McCLUSKY ND

Field number:

LAB. NUMBER 88C104

Sample depth: Feet

Sample description: COMPACTED TO 1.16 GMS/CC SATURATED AT START OF TEST

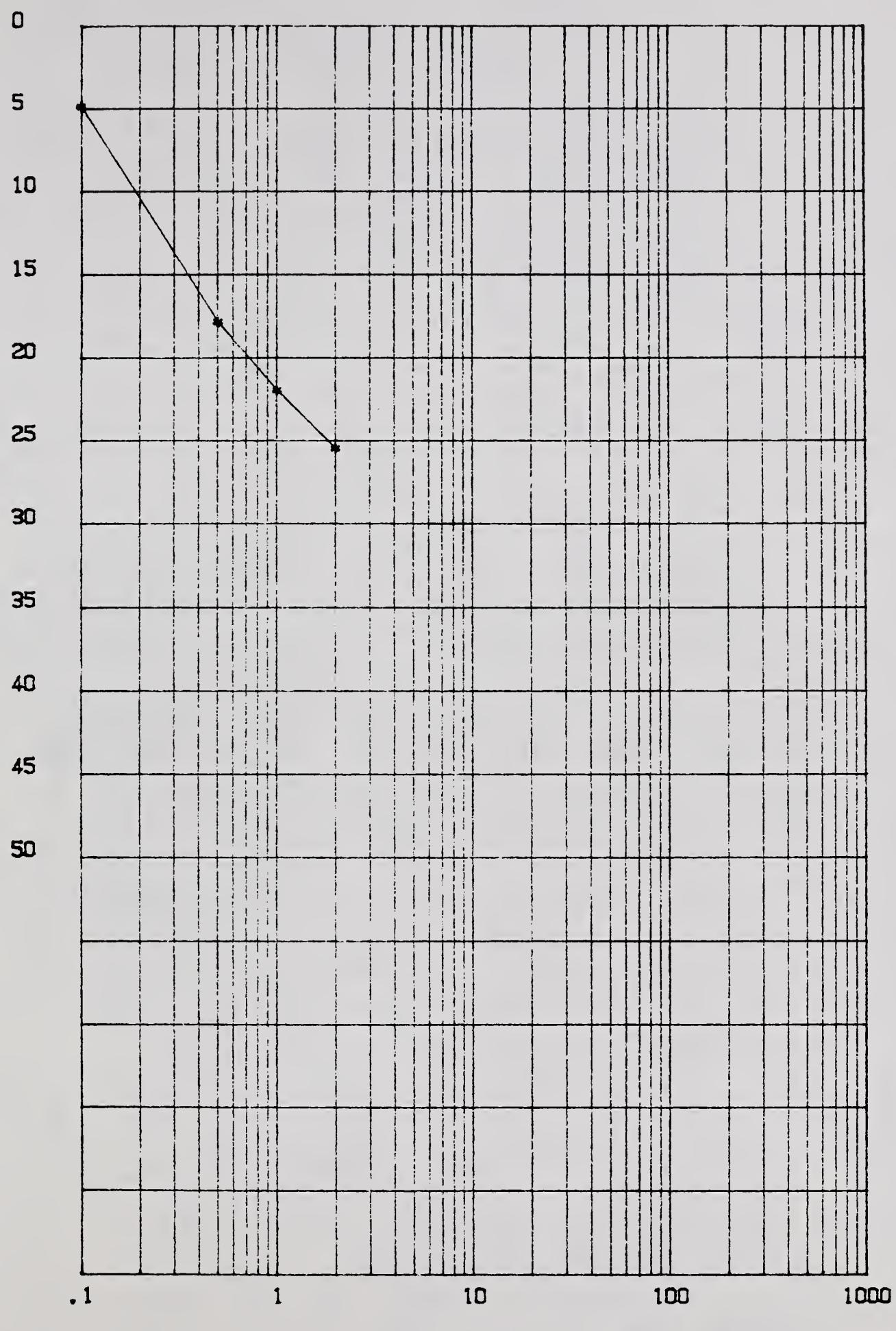
SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	111.8 g
INITIAL DRY WEIGHT:	93.3 g
INITIAL WATER CONTENT:	19.8 %
INITIAL WET DENSITY:	86.768 PCF
INITIAL DRY DENSITY:	72.41 PCF
SPECIFIC GRAVITY:	2.59
INITIAL VOID RATIO:	1.233
FINAL WET WEIGHT:	117.42 g
FINAL WATER CONTENT:	25.8 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.0486	1.1240	4.86
2.0	.50	.1785	.8340	17.85
3.0	1.00	.2198	.7420	21.98
4.0	2.00	.2551	.6630	25.51



Test 2

PERCENT CONSOLIDATION-LAB. SAMPLE.



CONSOLIDATION PRESSURE, ksf

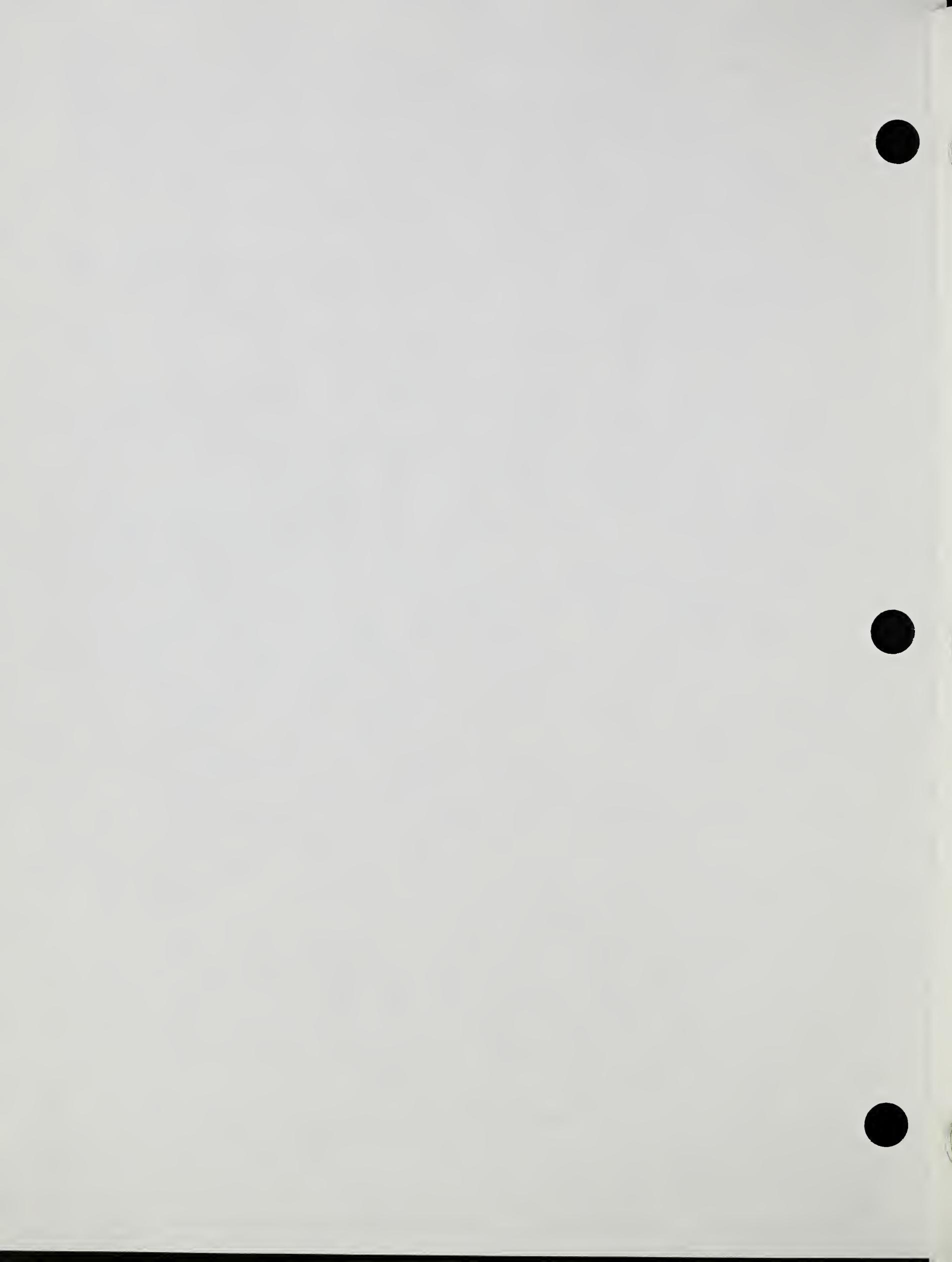
Project: WILLIAMS-McCLUSKY ND

AB. NUMBER 88C104

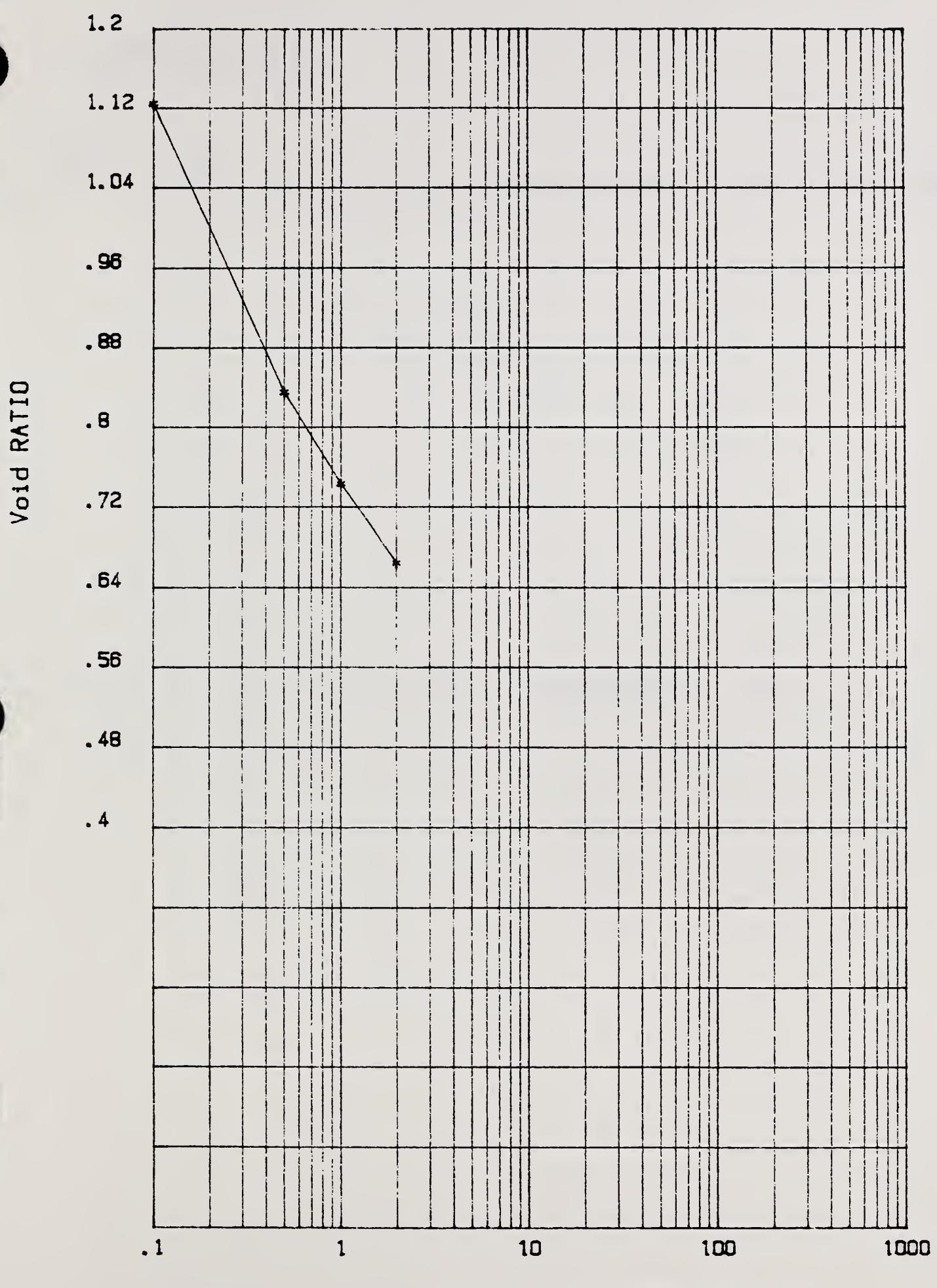
Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



Test 2



Project: WILLIAMS-McCLUSKY ND

Field number:

USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C104

Sample depth: Feet

PA
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LA
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GE

PA

TEST CONSOLIDATION TEST

TEST NO. 880105 DATE 10/10/88

WEPP Sample

Project: WOODWARD-Oklahoma

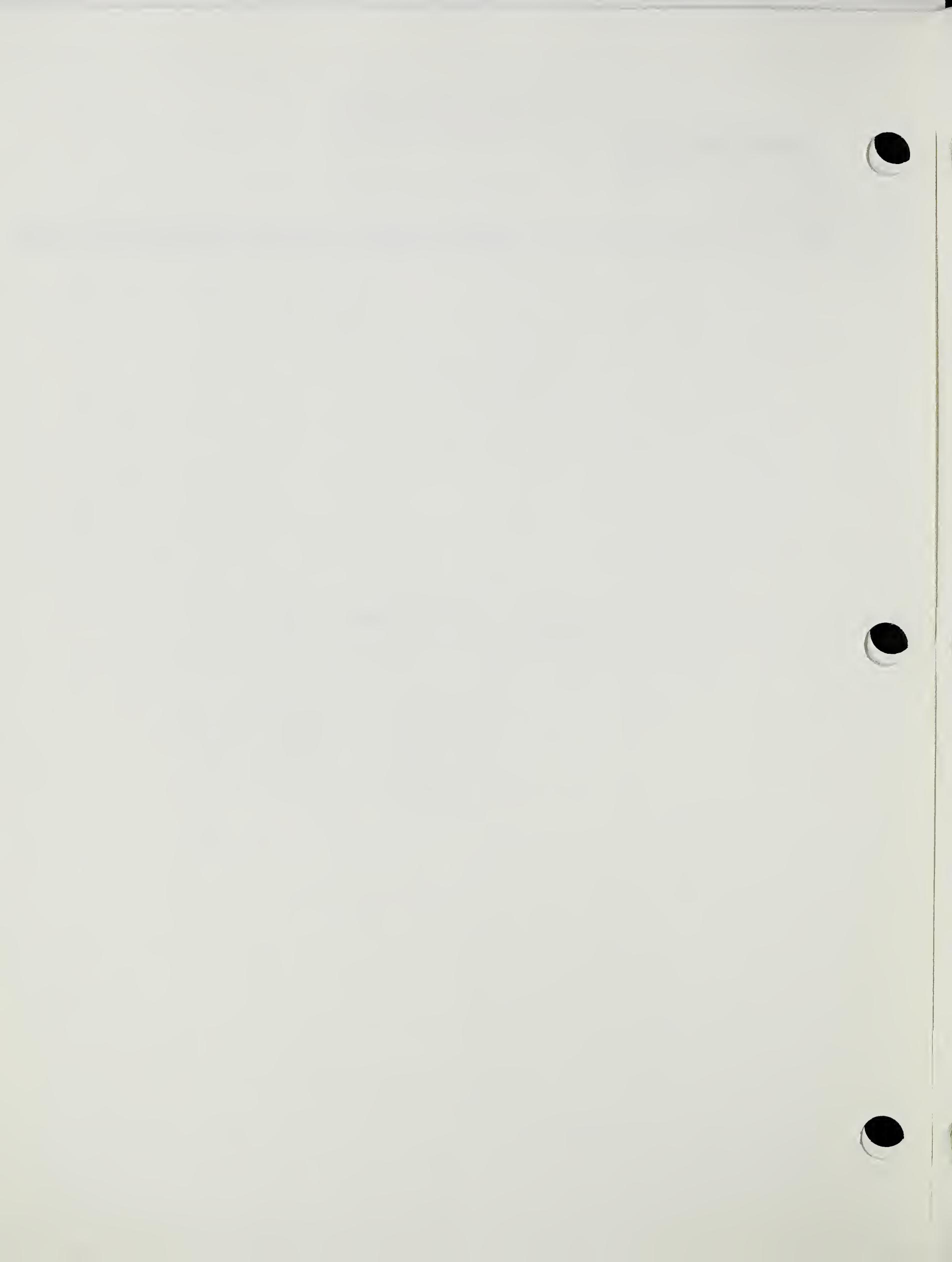
Field number:

LAB. NUMBER 880105

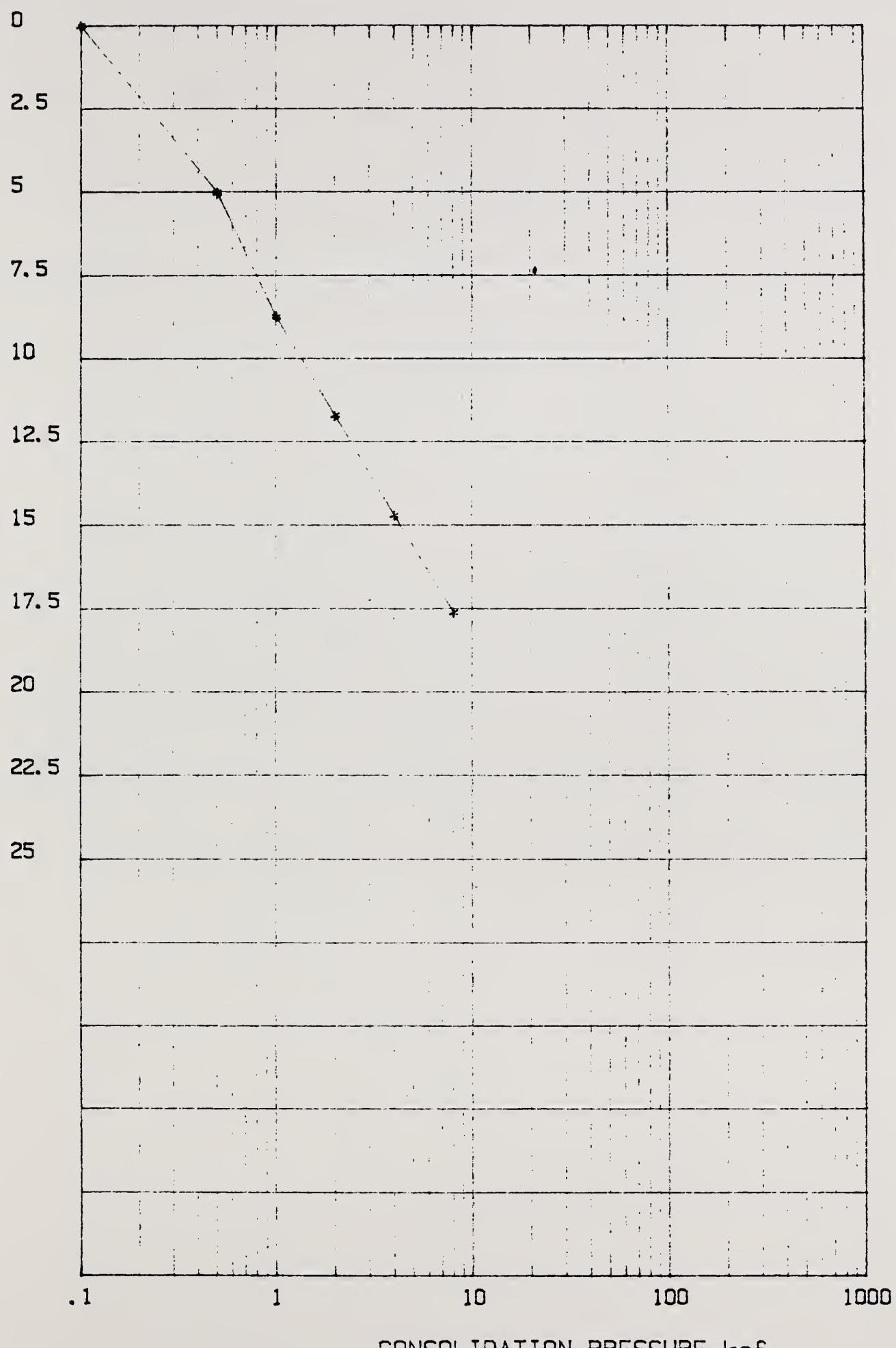
Sample depth: Feet

Sample description: COMPACTED TO 1.41GMS/CC CL-ML LL=25 PI=7 SATURATED AT START OF TEST

TEST	LOAD (KIPS)	CHANGE IN HEIGHT (in.)	VOIDS RATIO
1	0.00	0.00	0.00
2	0.75	0.03	0.03
3	1.50	0.06	0.06
4	2.25	0.09	0.09
5	3.00	0.12	0.12
6	3.75	0.15	0.15
7	4.50	0.18	0.18
8	5.25	0.21	0.21
9	6.00	0.24	0.24
10	6.75	0.27	0.27
11	7.50	0.30	0.30
12	8.25	0.33	0.33
13	9.00	0.36	0.36
14	9.75	0.39	0.39
15	10.50	0.42	0.42
16	11.25	0.45	0.45
17	12.00	0.48	0.48
18	12.75	0.51	0.51
19	13.50	0.54	0.54
20	14.25	0.57	0.57
21	15.00	0.60	0.60
22	15.75	0.63	0.63
23	16.50	0.66	0.66
24	17.25	0.69	0.69
25	18.00	0.72	0.72
26	18.75	0.75	0.75
27	19.50	0.78	0.78
28	20.25	0.81	0.81
29	21.00	0.84	0.84
30	21.75	0.87	0.87
31	22.50	0.90	0.90
32	23.25	0.93	0.93
33	24.00	0.96	0.96
34	24.75	0.99	0.99
35	25.50	1.02	1.02
36	26.25	1.05	1.05
37	27.00	1.08	1.08
38	27.75	1.11	1.11
39	28.50	1.14	1.14
40	29.25	1.17	1.17
41	30.00	1.20	1.20
42	30.75	1.23	1.23
43	31.50	1.26	1.26
44	32.25	1.29	1.29
45	33.00	1.32	1.32
46	33.75	1.35	1.35
47	34.50	1.38	1.38
48	35.25	1.41	1.41
49	36.00	1.44	1.44
50	36.75	1.47	1.47
51	37.50	1.50	1.50
52	38.25	1.53	1.53
53	39.00	1.56	1.56
54	39.75	1.59	1.59
55	40.50	1.62	1.62
56	41.25	1.65	1.65
57	42.00	1.68	1.68
58	42.75	1.71	1.71
59	43.50	1.74	1.74
60	44.25	1.77	1.77
61	45.00	1.80	1.80
62	45.75	1.83	1.83
63	46.50	1.86	1.86
64	47.25	1.89	1.89
65	48.00	1.92	1.92
66	48.75	1.95	1.95
67	49.50	1.98	1.98
68	50.25	2.01	2.01
69	51.00	2.04	2.04
70	51.75	2.07	2.07
71	52.50	2.10	2.10
72	53.25	2.13	2.13
73	54.00	2.16	2.16
74	54.75	2.19	2.19
75	55.50	2.22	2.22
76	56.25	2.25	2.25
77	57.00	2.28	2.28
78	57.75	2.31	2.31
79	58.50	2.34	2.34
80	59.25	2.37	2.37
81	60.00	2.40	2.40
82	60.75	2.43	2.43
83	61.50	2.46	2.46
84	62.25	2.49	2.49
85	63.00	2.52	2.52
86	63.75	2.55	2.55
87	64.50	2.58	2.58
88	65.25	2.61	2.61
89	66.00	2.64	2.64
90	66.75	2.67	2.67
91	67.50	2.70	2.70
92	68.25	2.73	2.73
93	69.00	2.76	2.76
94	69.75	2.79	2.79
95	70.50	2.82	2.82
96	71.25	2.85	2.85
97	72.00	2.88	2.88
98	72.75	2.91	2.91
99	73.50	2.94	2.94
100	74.25	2.97	2.97
101	75.00	3.00	3.00
102	75.75	3.03	3.03
103	76.50	3.06	3.06
104	77.25	3.09	3.09
105	78.00	3.12	3.12
106	78.75	3.15	3.15
107	79.50	3.18	3.18
108	80.25	3.21	3.21
109	81.00	3.24	3.24
110	81.75	3.27	3.27
111	82.50	3.30	3.30
112	83.25	3.33	3.33
113	84.00	3.36	3.36
114	84.75	3.39	3.39
115	85.50	3.42	3.42
116	86.25	3.45	3.45
117	87.00	3.48	3.48
118	87.75	3.51	3.51
119	88.50	3.54	3.54
120	89.25	3.57	3.57
121	90.00	3.60	3.60
122	90.75	3.63	3.63
123	91.50	3.66	3.66
124	92.25	3.69	3.69
125	93.00	3.72	3.72
126	93.75	3.75	3.75
127	94.50	3.78	3.78
128	95.25	3.81	3.81
129	96.00	3.84	3.84
130	96.75	3.87	3.87
131	97.50	3.90	3.90
132	98.25	3.93	3.93
133	99.00	3.96	3.96
134	99.75	3.99	3.99
135	100.50	4.02	4.02
136	101.25	4.05	4.05
137	102.00	4.08	4.08
138	102.75	4.11	4.11
139	103.50	4.14	4.14
140	104.25	4.17	4.17
141	105.00	4.20	4.20
142	105.75	4.23	4.23
143	106.50	4.26	4.26
144	107.25	4.29	4.29
145	108.00	4.32	4.32
146	108.75	4.35	4.35
147	109.50	4.38	4.38
148	110.25	4.41	4.41
149	111.00	4.44	4.44
150	111.75	4.47	4.47
151	112.50	4.50	4.50
152	113.25	4.53	4.53
153	114.00	4.56	4.56
154	114.75	4.59	4.59
155	115.50	4.62	4.62
156	116.25	4.65	4.65
157	117.00	4.68	4.68
158	117.75	4.71	4.71
159	118.50	4.74	4.74
160	119.25	4.77	4.77
161	120.00	4.80	4.80
162	120.75	4.83	4.83
163	121.50	4.86	4.86
164	122.25	4.89	4.89
165	123.00	4.92	4.92
166	123.75	4.95	4.95
167	124.50	4.98	4.98
168	125.25	5.01	5.01
169	126.00	5.04	5.04
170	126.75	5.07	5.07
171	127.50	5.10	5.10
172	128.25	5.13	5.13
173	129.00	5.16	5.16
174	129.75	5.19	5.19
175	130.50	5.22	5.22
176	131.25	5.25	5.25
177	132.00	5.28	5.28
178	132.75	5.31	5.31
179	133.50	5.34	5.34
180	134.25	5.37	5.37
181	135.00	5.40	5.40
182	135.75	5.43	5.43
183	136.50	5.46	5.46
184	137.25	5.49	5.49
185	138.00	5.52	5.52
186	138.75	5.55	5.55
187	139.50	5.58	5.58
188	140.25	5.61	5.61
189	141.00	5.64	5.64
190	141.75	5.67	5.67
191	142.50	5.70	5.70
192	143.25	5.73	5.73
193	144.00	5.76	5.76
194	144.75	5.79	5.79
195	145.50	5.82	5.82
196	146.25	5.85	5.85
197	147.00	5.88	5.88
198	147.75	5.91	5.91
199	148.50	5.94	5.94
200	149.25	5.97	5.97
201	150.00	6.00	6.00
202	150.75	6.03	6.03
203	151.50	6.06	6.06
204	152.25	6.09	6.09
205	153.00	6.12	6.12
206	153.75	6.15	6.15
207	154.50	6.18	6.18
208	155.25	6.21	6.21
209	156.00	6.24	6.24
210	156.75	6.27	6.27
211	157.50	6.30	6.30
212	158.25	6.33	6.33
213	159.00	6.36	6.36
214	159.75	6.39	6.39
215	160.50	6.42	6.42
216	161.25	6.45	6.45
217	162.00	6.48	6.48
218	162.75	6.51	6.51
219	163.50	6.54	6.54
220	164.25	6.57	6.57
221	165.00	6.60	6.60
222	165.75	6.63	6.63



PERCENT CONSOLIDATION-LAB. SAMPLE.



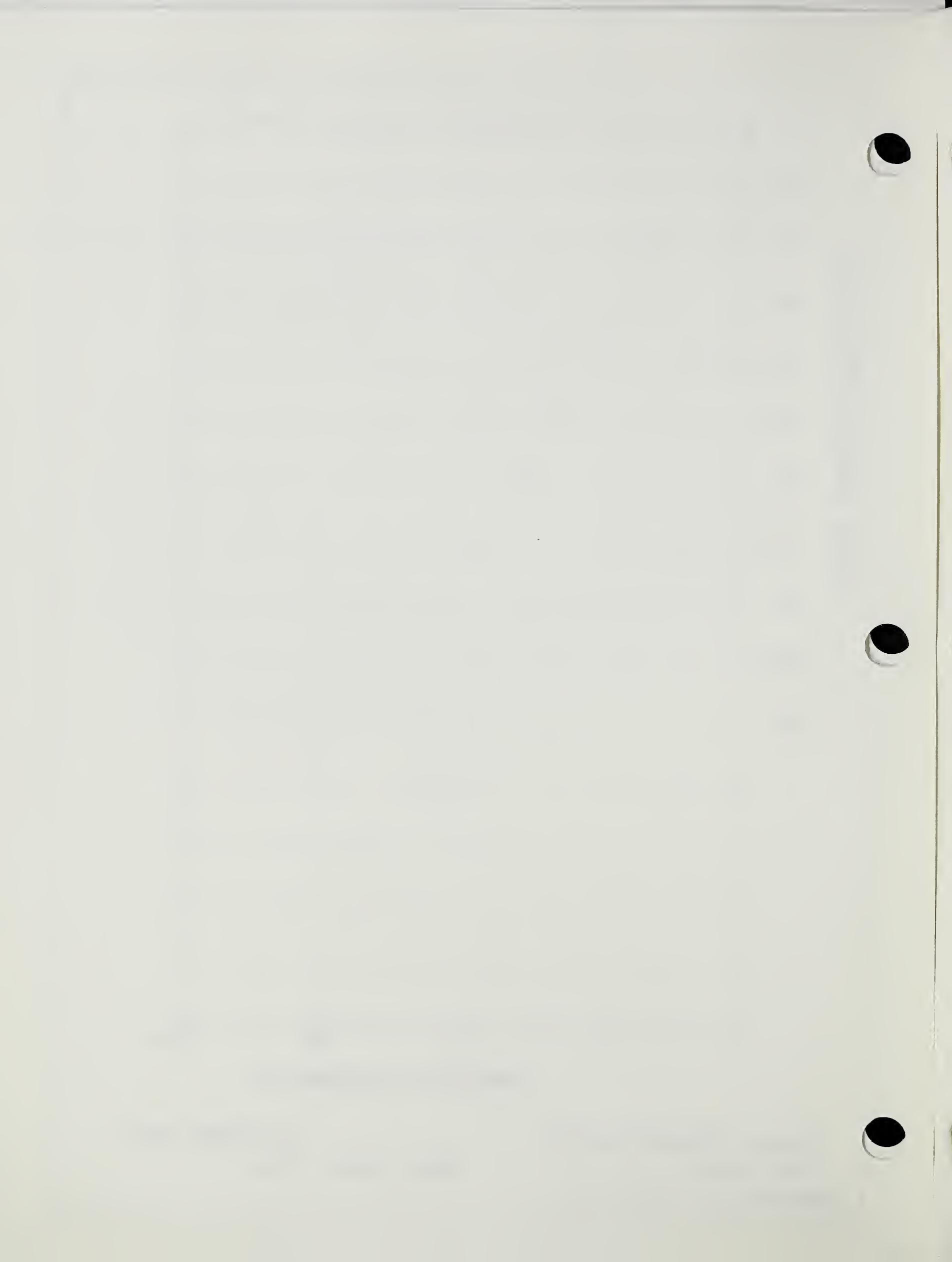
Project: WOODWARD-OKLAHOMA

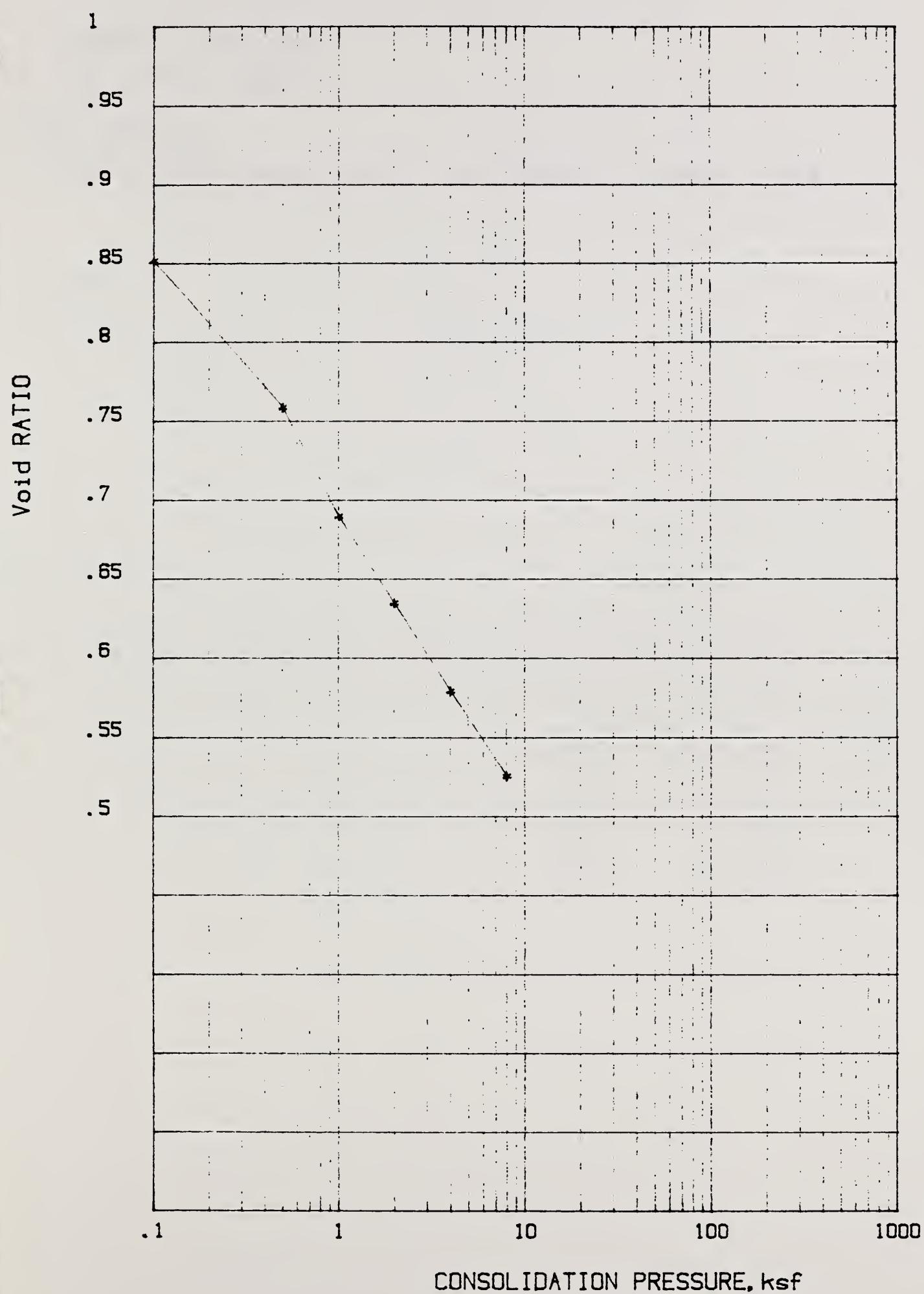
LAB. NUMBER 88C105

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.





Project: WOODWARD-OKLAHOMA

LAB. NUMBER 88C105

Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.

100 150

TEST NO. S-3 CONSOLIDATION TEST

WEPP Sample

Project: ZAHL-NORTH DAKOTA

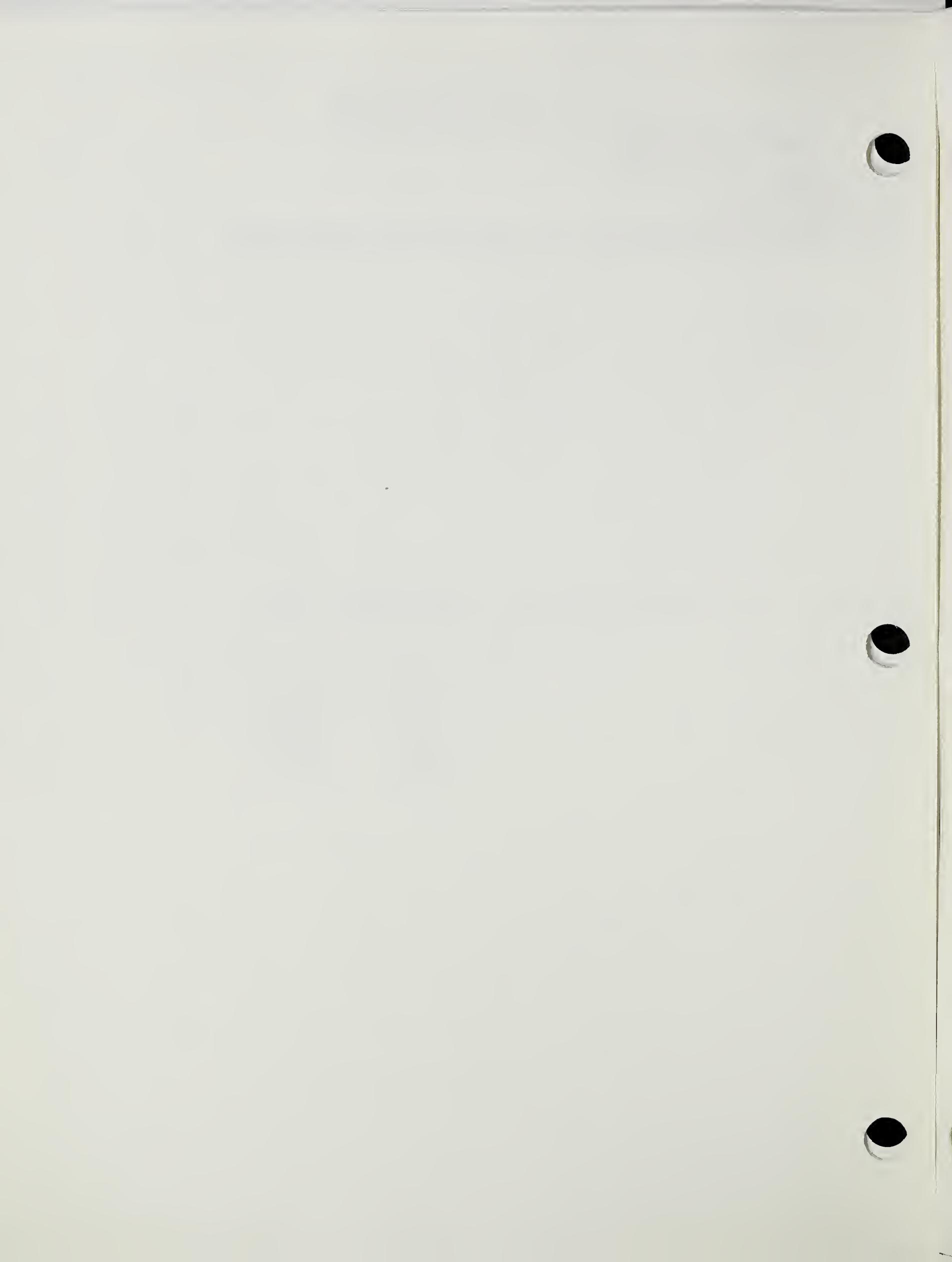
Field number:

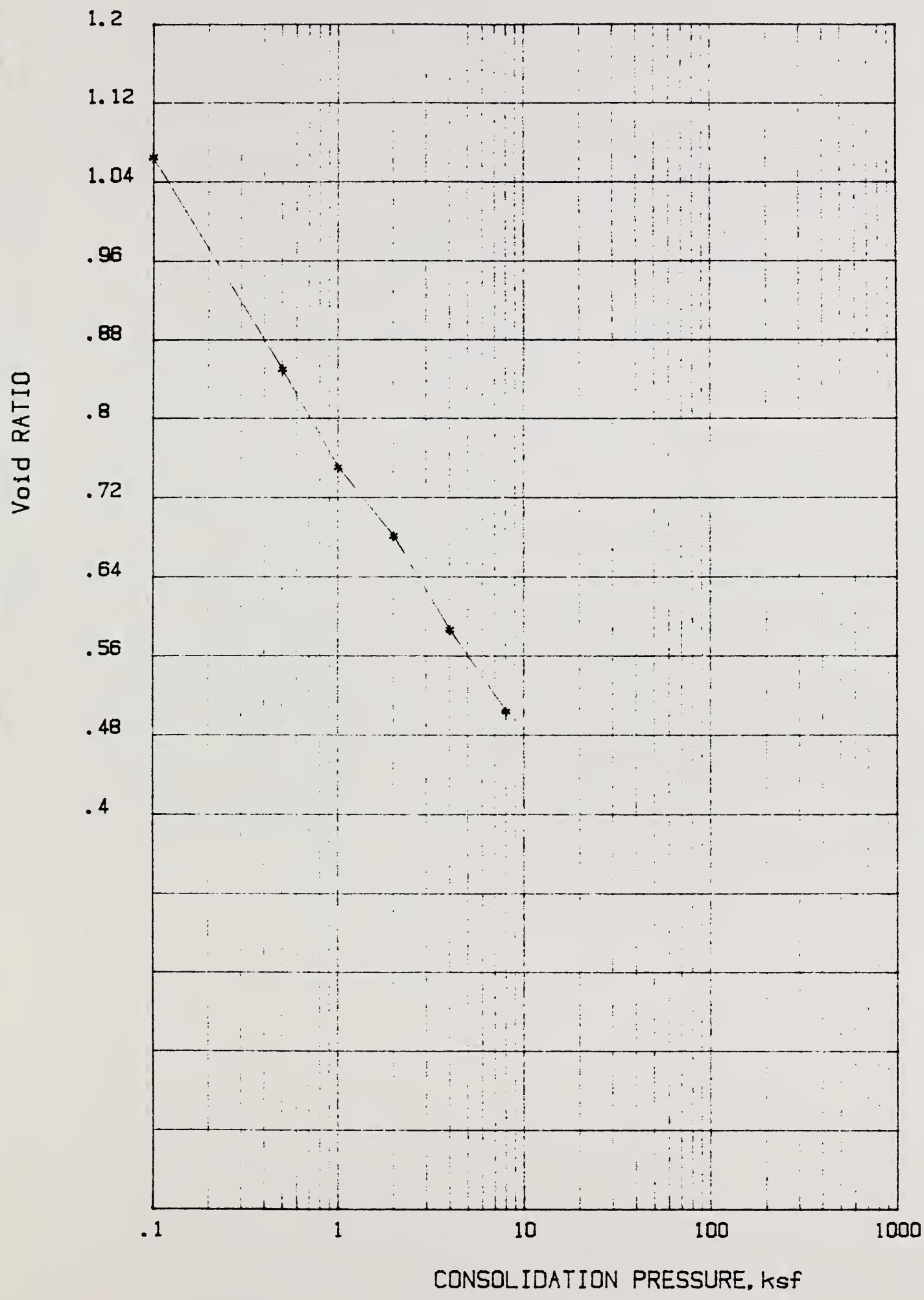
LAB. NUMBER 88C106

Sample depth: Feet

Sample description: COMPACTED TO 1.25 GMS/CC CL LL=31 PI=13

SAMPLE DIAMETER:	2.5 ins
INITIAL HEIGHT:	1 ins
INITIAL VOLUME:	80.479 cm ³
1st. SETT. OF LOAD:	105.02 g
1st. DRY WEIGHT:	100.53 g
2nd. SETT. OF LOAD:	104.74 g
2nd. DRY WEIGHT:	101.53 g
3rd. SETT. OF LOAD:	101.02 g
3rd. DRY WEIGHT:	101.02 g
4th. SETT. OF LOAD:	100.74 g
4th. DRY WEIGHT:	100.74 g
5th. SETT. OF LOAD:	100.53 g
5th. DRY WEIGHT:	100.53 g
6th. SETT. OF LOAD:	100.32 g
6th. DRY WEIGHT:	100.32 g
7th. SETT. OF LOAD:	100.12 g
7th. DRY WEIGHT:	100.12 g
8th. SETT. OF LOAD:	100.00 g
8th. DRY WEIGHT:	100.00 g
9th. SETT. OF LOAD:	99.88 g
9th. DRY WEIGHT:	99.88 g
10th. SETT. OF LOAD:	99.74 g
10th. DRY WEIGHT:	99.74 g
11th. SETT. OF LOAD:	99.60 g
11th. DRY WEIGHT:	99.60 g
12th. SETT. OF LOAD:	99.48 g
12th. DRY WEIGHT:	99.48 g
13th. SETT. OF LOAD:	99.36 g
13th. DRY WEIGHT:	99.36 g
14th. SETT. OF LOAD:	99.24 g
14th. DRY WEIGHT:	99.24 g
15th. SETT. OF LOAD:	99.12 g
15th. DRY WEIGHT:	99.12 g
16th. SETT. OF LOAD:	99.00 g
16th. DRY WEIGHT:	99.00 g
17th. SETT. OF LOAD:	98.88 g
17th. DRY WEIGHT:	98.88 g
18th. SETT. OF LOAD:	98.74 g
18th. DRY WEIGHT:	98.74 g
19th. SETT. OF LOAD:	98.60 g
19th. DRY WEIGHT:	98.60 g
20th. SETT. OF LOAD:	98.48 g
20th. DRY WEIGHT:	98.48 g
21st. SETT. OF LOAD:	98.36 g
21st. DRY WEIGHT:	98.36 g
22nd. SETT. OF LOAD:	98.24 g
22nd. DRY WEIGHT:	98.24 g
23rd. SETT. OF LOAD:	98.12 g
23rd. DRY WEIGHT:	98.12 g
24th. SETT. OF LOAD:	98.00 g
24th. DRY WEIGHT:	98.00 g
25th. SETT. OF LOAD:	97.88 g
25th. DRY WEIGHT:	97.88 g
26th. SETT. OF LOAD:	97.74 g
26th. DRY WEIGHT:	97.74 g
27th. SETT. OF LOAD:	97.60 g
27th. DRY WEIGHT:	97.60 g
28th. SETT. OF LOAD:	97.48 g
28th. DRY WEIGHT:	97.48 g
29th. SETT. OF LOAD:	97.36 g
29th. DRY WEIGHT:	97.36 g
30th. SETT. OF LOAD:	97.24 g
30th. DRY WEIGHT:	97.24 g
31st. SETT. OF LOAD:	97.12 g
31st. DRY WEIGHT:	97.12 g
32nd. SETT. OF LOAD:	97.00 g
32nd. DRY WEIGHT:	97.00 g
33rd. SETT. OF LOAD:	96.88 g
33rd. DRY WEIGHT:	96.88 g
34th. SETT. OF LOAD:	96.74 g
34th. DRY WEIGHT:	96.74 g
35th. SETT. OF LOAD:	96.60 g
35th. DRY WEIGHT:	96.60 g
36th. SETT. OF LOAD:	96.48 g
36th. DRY WEIGHT:	96.48 g
37th. SETT. OF LOAD:	96.36 g
37th. DRY WEIGHT:	96.36 g
38th. SETT. OF LOAD:	96.24 g
38th. DRY WEIGHT:	96.24 g
39th. SETT. OF LOAD:	96.12 g
39th. DRY WEIGHT:	96.12 g
40th. SETT. OF LOAD:	96.00 g
40th. DRY WEIGHT:	96.00 g
41st. SETT. OF LOAD:	95.88 g
41st. DRY WEIGHT:	95.88 g
42nd. SETT. OF LOAD:	95.74 g
42nd. DRY WEIGHT:	95.74 g
43rd. SETT. OF LOAD:	95.60 g
43rd. DRY WEIGHT:	95.60 g
44th. SETT. OF LOAD:	95.48 g
44th. DRY WEIGHT:	95.48 g
45th. SETT. OF LOAD:	95.36 g
45th. DRY WEIGHT:	95.36 g
46th. SETT. OF LOAD:	95.24 g
46th. DRY WEIGHT:	95.24 g
47th. SETT. OF LOAD:	95.12 g
47th. DRY WEIGHT:	95.12 g
48th. SETT. OF LOAD:	95.00 g
48th. DRY WEIGHT:	95.00 g
49th. SETT. OF LOAD:	94.88 g
49th. DRY WEIGHT:	94.88 g
50th. SETT. OF LOAD:	94.74 g
50th. DRY WEIGHT:	94.74 g
51st. SETT. OF LOAD:	94.60 g
51st. DRY WEIGHT:	94.60 g
52nd. SETT. OF LOAD:	94.48 g
52nd. DRY WEIGHT:	94.48 g
53rd. SETT. OF LOAD:	94.36 g
53rd. DRY WEIGHT:	94.36 g
54th. SETT. OF LOAD:	94.24 g
54th. DRY WEIGHT:	94.24 g
55th. SETT. OF LOAD:	94.12 g
55th. DRY WEIGHT:	94.12 g
56th. SETT. OF LOAD:	94.00 g
56th. DRY WEIGHT:	94.00 g
57th. SETT. OF LOAD:	93.88 g
57th. DRY WEIGHT:	93.88 g
58th. SETT. OF LOAD:	93.74 g
58th. DRY WEIGHT:	93.74 g
59th. SETT. OF LOAD:	93.60 g
59th. DRY WEIGHT:	93.60 g
60th. SETT. OF LOAD:	93.48 g
60th. DRY WEIGHT:	93.48 g
61st. SETT. OF LOAD:	93.36 g
61st. DRY WEIGHT:	93.36 g
62nd. SETT. OF LOAD:	93.24 g
62nd. DRY WEIGHT:	93.24 g
63rd. SETT. OF LOAD:	93.12 g
63rd. DRY WEIGHT:	93.12 g
64th. SETT. OF LOAD:	93.00 g
64th. DRY WEIGHT:	93.00 g
65th. SETT. OF LOAD:	92.88 g
65th. DRY WEIGHT:	92.88 g
66th. SETT. OF LOAD:	92.74 g
66th. DRY WEIGHT:	92.74 g
67th. SETT. OF LOAD:	92.60 g
67th. DRY WEIGHT:	92.60 g
68th. SETT. OF LOAD:	92.48 g
68th. DRY WEIGHT:	92.48 g
69th. SETT. OF LOAD:	92.36 g
69th. DRY WEIGHT:	92.36 g
70th. SETT. OF LOAD:	92.24 g
70th. DRY WEIGHT:	92.24 g
71st. SETT. OF LOAD:	92.12 g
71st. DRY WEIGHT:	92.12 g
72nd. SETT. OF LOAD:	92.00 g
72nd. DRY WEIGHT:	92.00 g
73rd. SETT. OF LOAD:	91.88 g
73rd. DRY WEIGHT:	91.88 g
74th. SETT. OF LOAD:	91.74 g
74th. DRY WEIGHT:	91.74 g
75th. SETT. OF LOAD:	91.60 g
75th. DRY WEIGHT:	91.60 g
76th. SETT. OF LOAD:	91.48 g
76th. DRY WEIGHT:	91.48 g
77th. SETT. OF LOAD:	91.36 g
77th. DRY WEIGHT:	91.36 g
78th. SETT. OF LOAD:	91.24 g
78th. DRY WEIGHT:	91.24 g
79th. SETT. OF LOAD:	91.12 g
79th. DRY WEIGHT:	91.12 g
80th. SETT. OF LOAD:	91.00 g
80th. DRY WEIGHT:	91.00 g
81st. SETT. OF LOAD:	90.88 g
81st. DRY WEIGHT:	90.88 g
82nd. SETT. OF LOAD:	90.74 g
82nd. DRY WEIGHT:	90.74 g
83rd. SETT. OF LOAD:	90.60 g
83rd. DRY WEIGHT:	90.60 g
84th. SETT. OF LOAD:	90.48 g
84th. DRY WEIGHT:	90.48 g
85th. SETT. OF LOAD:	90.36 g
85th. DRY WEIGHT:	90.36 g
86th. SETT. OF LOAD:	90.24 g
86th. DRY WEIGHT:	90.24 g
87th. SETT. OF LOAD:	90.12 g
87th. DRY WEIGHT:	90.12 g
88th. SETT. OF LOAD:	90.00 g
88th. DRY WEIGHT:	90.00 g
89th. SETT. OF LOAD:	89.88 g
89th. DRY WEIGHT:	89.88 g
90th. SETT. OF LOAD:	89.74 g
90th. DRY WEIGHT:	89.74 g
91st. SETT. OF LOAD:	89.60 g
91st. DRY WEIGHT:	89.60 g
92nd. SETT. OF LOAD:	89.48 g
92nd. DRY WEIGHT:	89.48 g
93rd. SETT. OF LOAD:	89.36 g
93rd. DRY WEIGHT:	89.36 g
94th. SETT. OF LOAD:	89.24 g
94th. DRY WEIGHT:	89.24 g
95th. SETT. OF LOAD:	89.12 g
95th. DRY WEIGHT:	89.12 g
96th. SETT. OF LOAD:	89.00 g
96th. DRY WEIGHT:	89.00 g
97th. SETT. OF LOAD:	88.88 g
97th. DRY WEIGHT:	88.88 g
98th. SETT. OF LOAD:	88.74 g
98th. DRY WEIGHT:	88.74 g
99th. SETT. OF LOAD:	88.60 g
99th. DRY WEIGHT:	88.60 g
100th. SETT. OF LOAD:	88.48 g
100th. DRY WEIGHT:	88.48 g
101st. SETT. OF LOAD:	88.36 g
101st. DRY WEIGHT:	88.36 g
102nd. SETT. OF LOAD:	88.24 g
102nd. DRY WEIGHT:	88.24 g
103rd. SETT. OF LOAD:	88.12 g
103rd. DRY WEIGHT:	88.12 g
104th. SETT. OF LOAD:	88.00 g
104th. DRY WEIGHT:	88.00 g
105th. SETT. OF LOAD:	87.88 g
105th. DRY WEIGHT:	87.88 g
106th. SETT. OF LOAD:	87.74 g
106th. DRY WEIGHT:	87.74 g
107th. SETT. OF LOAD:	87.60 g
107th. DRY WEIGHT:	87.60 g
108th. SETT. OF LOAD:	87.48 g
108th. DRY WEIGHT:	87.48 g
109th. SETT. OF LOAD:	87.36 g
109th. DRY WEIGHT:	87.36 g
110th. SETT. OF LOAD:	87.24 g
110th. DRY WEIGHT:	87.24 g
111th. SETT. OF LOAD:	87.12 g
111th. DRY WEIGHT:	87.12 g
112th. SETT. OF LOAD:	87.00 g
112th. DRY WEIGHT:	87.00 g
113th. SETT. OF LOAD:	86.88 g
113th. DRY WEIGHT:	86.88 g
114th. SETT. OF LOAD:	86.74 g
114th. DRY WEIGHT:	86.74 g
115th. SETT. OF LOAD:	86.60 g
115th. DRY WEIGHT:	86.60 g
116th. SETT. OF LOAD:	86.48 g
116th. DRY WEIGHT:	86.48 g
117th. SETT. OF LOAD:	86.36 g
117th. DRY WEIGHT:	86.36 g
118th. SETT. OF LOAD:	86.24 g
118th. DRY WEIGHT:	86.24 g
119th. SETT. OF LOAD:	86.12 g
119th. DRY WEIGHT:	86.12 g
120th. SETT. OF LOAD:	86.00 g
120th. DRY WEIGHT:	86.00 g
121st. SETT. OF LOAD:	85.88 g
121st. DRY WEIGHT:	85.88 g
122nd. SETT. OF LOAD:	85.74 g
122nd. DRY WEIGHT:	85.74 g
123rd. SETT. OF LOAD:	85.60 g
123rd. DRY WEIGHT:	85.60 g
124th. SETT. OF LOAD:	85.48 g
124th. DRY WEIGHT:	85.48 g
125th. SETT. OF LOAD:	85.36 g
125th. DRY WEIGHT:	85.36 g
126th. SETT. OF LOAD:	85.24 g
126th. DRY WEIGHT:	85.24 g
127th. SETT. OF LOAD:	85.12 g
127th. DRY WEIGHT:	85.12 g
128th. SETT. OF LOAD:	85.00 g
128th. DRY WEIGHT:	85.00 g
129th. SETT. OF LOAD:	84.88 g
129th. DRY WEIGHT:	84.88 g
130th. SETT. OF LOAD:	84.74 g
130th. DRY WEIGHT:	84.74 g
131st. SETT. OF LOAD:	84.60 g
131st. DRY WEIGHT:	84.60 g
132nd. SETT. OF LOAD:	84.48 g
132nd. DRY WEIGHT:	84.48 g
133rd. SETT. OF LOAD:	84.36 g
133rd. DRY WEIGHT:	84.36 g
134th. SETT. OF LOAD:	84.24 g
134th. DRY WEIGHT:	84.24 g
135th. SETT. OF LOAD:	84.12 g
135th. DRY WEIGHT:	84.12 g
136th. SETT. OF LOAD:	84.00 g
136th. DRY WEIGHT:	84.00 g
137th. SETT. OF LOAD:	83.88 g
137th. DRY WEIGHT:	83.88 g
138th. SETT. OF LOAD:	83.74 g
138th. DRY WEIGHT:	83.74 g
139th. SETT. OF LOAD:	83.60 g
139th. DRY WEIGHT:	83.60 g
140th. SETT. OF LOAD:	83.48 g
140th. DRY WEIGHT:	83.48 g
141st. SETT. OF LOAD:	83.36 g
141st. DRY WEIGHT:	83.36 g
142nd. SETT. OF LOAD:	83.24 g
142nd. DRY WEIGHT:	83.24 g
143rd. SETT. OF LOAD:	83.12 g
143rd. DRY WEIGHT:	83.12 g
144th. SETT. OF LOAD:	83.00 g
144th. DRY WEIGHT:	83.00 g
145th. SETT. OF LOAD:	82.88 g
145th. DRY WEIGHT:	82.88 g
146th. SETT. OF LOAD:	82.74 g
146th. DRY WEIGHT:	82.74 g
147th. SETT. OF LOAD:	82.60 g
147th. DRY WEIGHT:	82.60 g
148th. SETT. OF LOAD:	82.48 g
148th. DRY WEIGHT:	82.48 g
149th. SETT. OF LOAD:	82.36 g
149th. DRY WEIGHT:	82.36 g
150th. SETT. OF LOAD:	82.24 g
150th. DRY WEIGHT:	82.24 g
151st. SETT. OF LOAD:	82.12 g
151st. DRY WEIGHT:	82.12 g
152nd. SETT. OF LOAD:	82.00 g
152nd. DRY WEIGHT:	82.00 g
153rd. SETT. OF LOAD:	81.88 g
153rd. DRY WEIGHT:	81.88 g
154th. SETT. OF LOAD:	81.74 g
154th. DRY WEIGHT:	81.74 g
155th. SETT. OF LOAD:	81.60 g
155th. DRY WEIGHT:	81.60 g
156th. SETT. OF LOAD:	81.48 g
156th. DRY WEIGHT:	81.48 g
157th. SETT. OF LOAD:	81.36 g





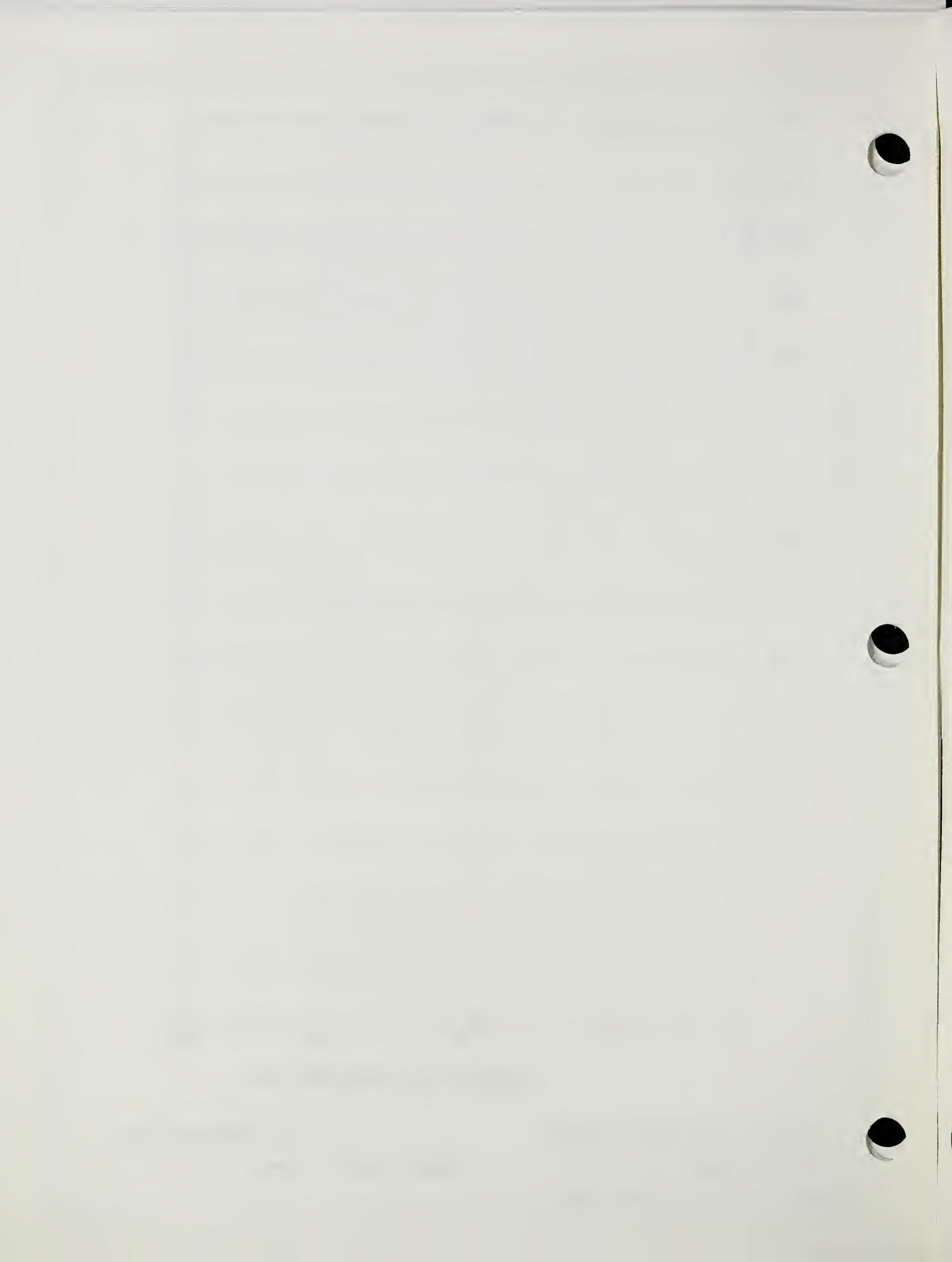
Project: ZAHL-NORTH DAKOTA

LAB. NUMBER 88C106

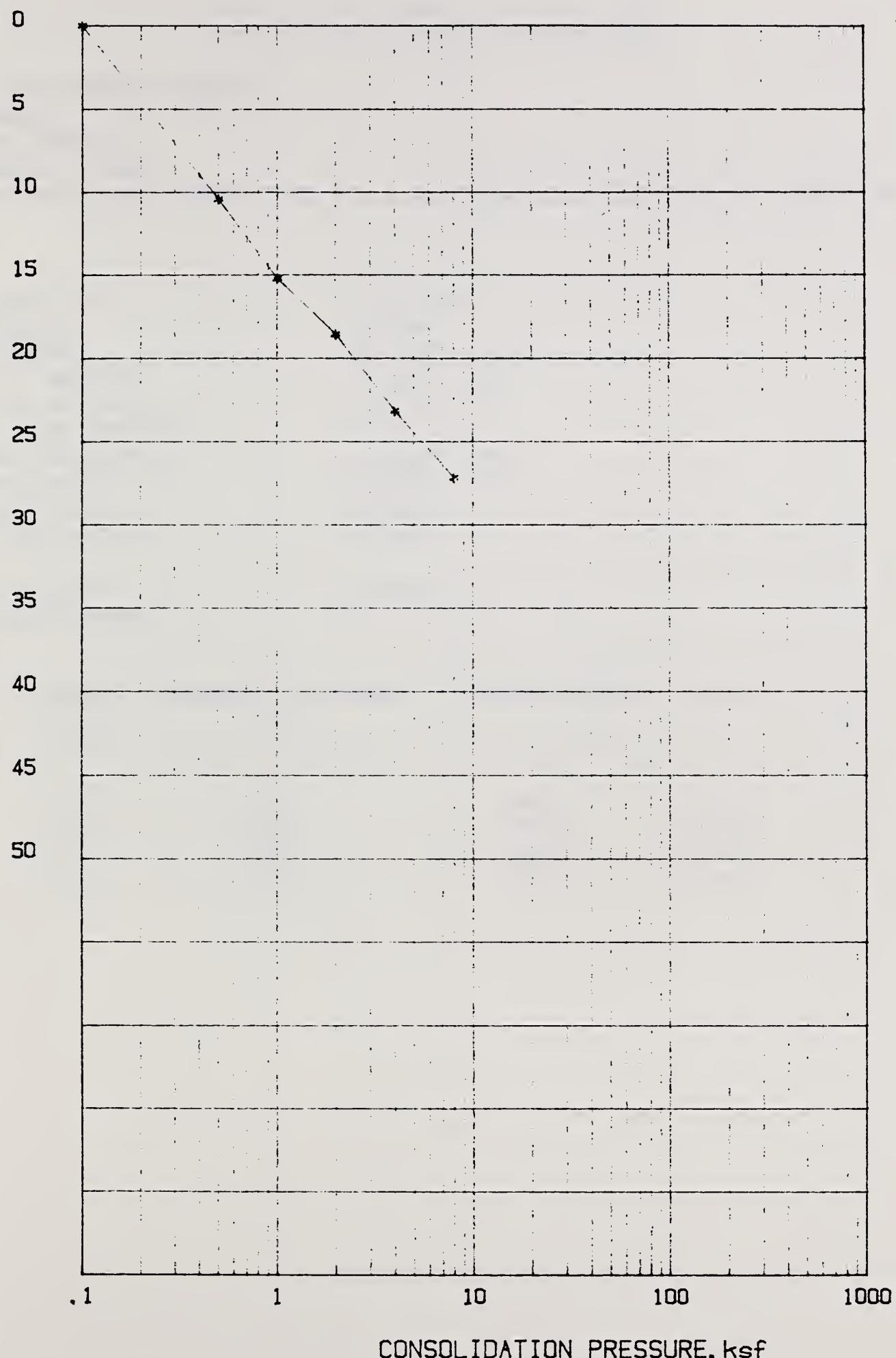
Field number:

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.



PERCENT CONSOLIDATION-LAB. SAMPLE,



Project: ZAHL-NORTH DAKOTA

Field number:

LAB. NUMBER 88C106

Sample depth: Feet

USDA-SCS S. M. L. LINCOLN NE.

P
R
E
L
I
S

S
S

Test 2

RESULTS OF CONSOLIDATION TEST

=====

Project: ZAHL-NORTH DAKOTA

Field number:

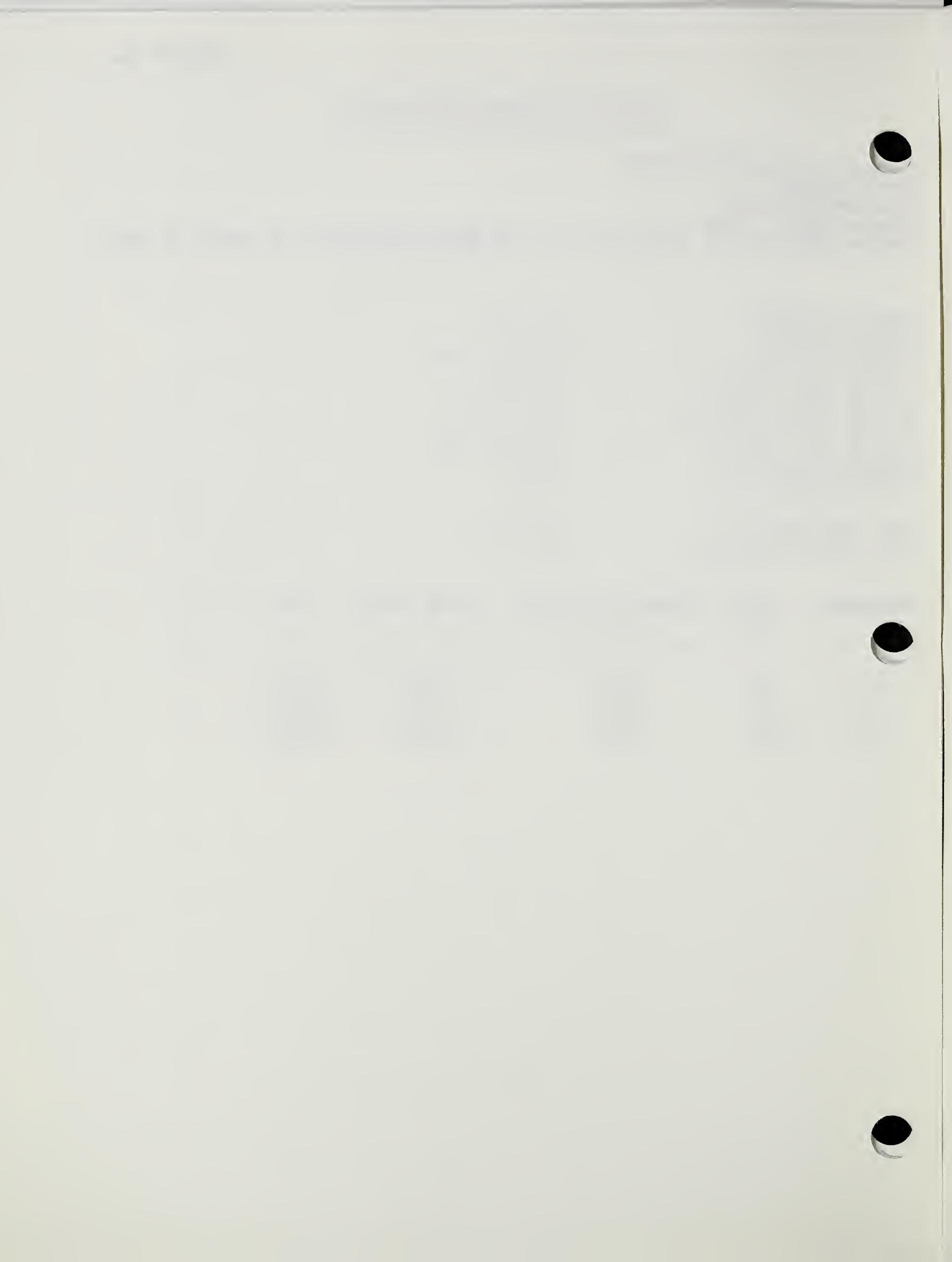
LAB. NUMBER 88C106

Sample depth: Feet

Sample description: COMPACTED TO 1.25 GMS/CC SATURATED AT START OF TEST

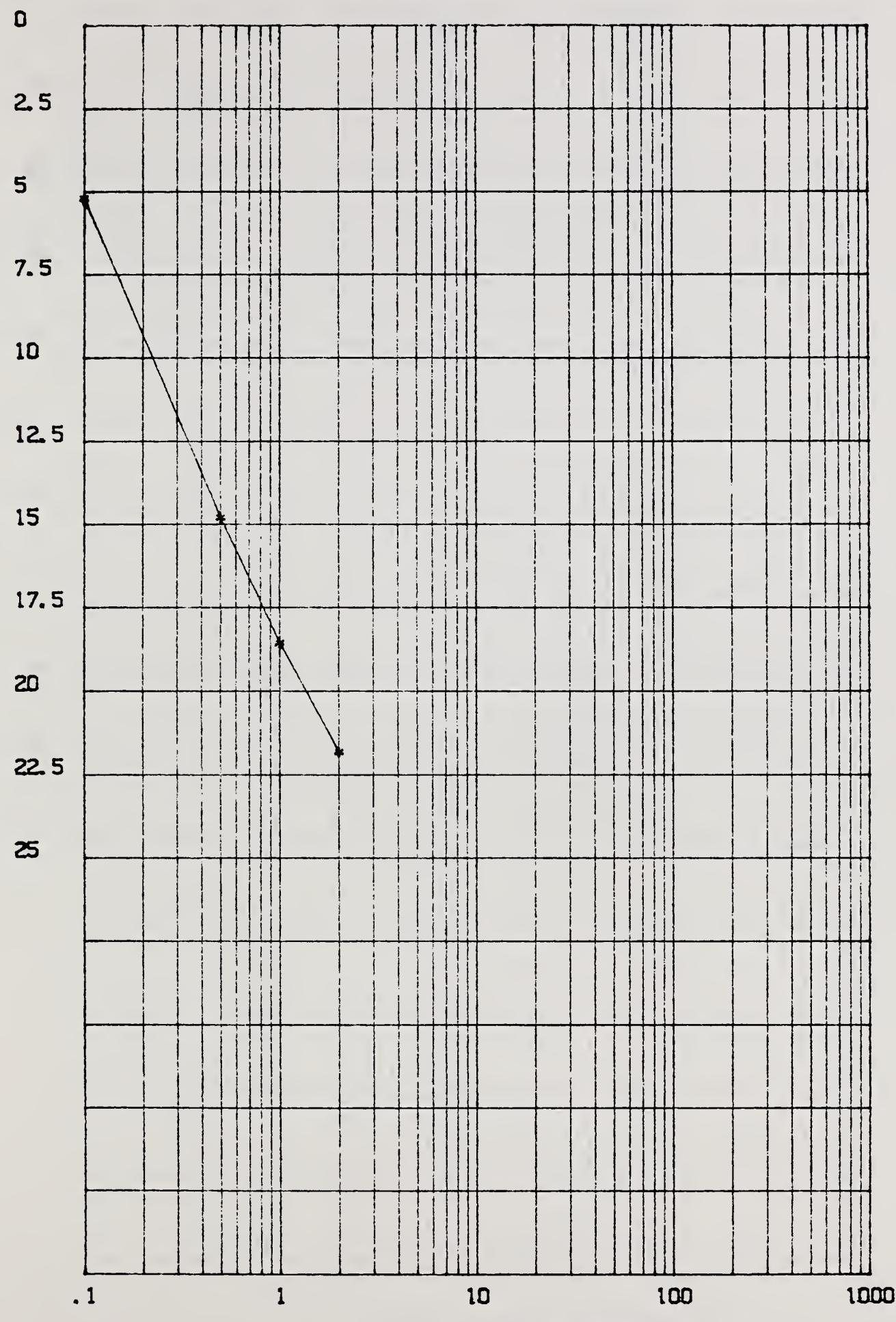
SAMPLE DIAMETER:	2.5 ins
SAMPLE HEIGHT:	1 ins
INITIAL VOLUME:	80.439 cm ³
INITIAL WET WEIGHT:	117.23 g
INITIAL DRY WEIGHT:	100.54 g
INITIAL WATER CONTENT:	16.6 %
INITIAL WET DENSITY:	90.983 PCF
INITIAL DRY DENSITY:	78.029 PCF
SPECIFIC GRAVITY:	2.58
INITIAL VOID RATIO:	1.064
FINAL WET WEIGHT:	123.67 g
FINAL WATER CONTENT:	23 %

INCREMENT	LOAD (ksf)	CHANGE IN HEIGHT (ins)	VOIDS RATIO	Su%
1.0	.10	.0520	.9560	5.20
2.0	.50	.1482	.7580	14.82
3.0	1.00	.1860	.6800	18.60
4.0	2.00	.2186	.6120	21.86



Test 2

PERCENT CONSOLIDATION-LAB. SAMPLE.



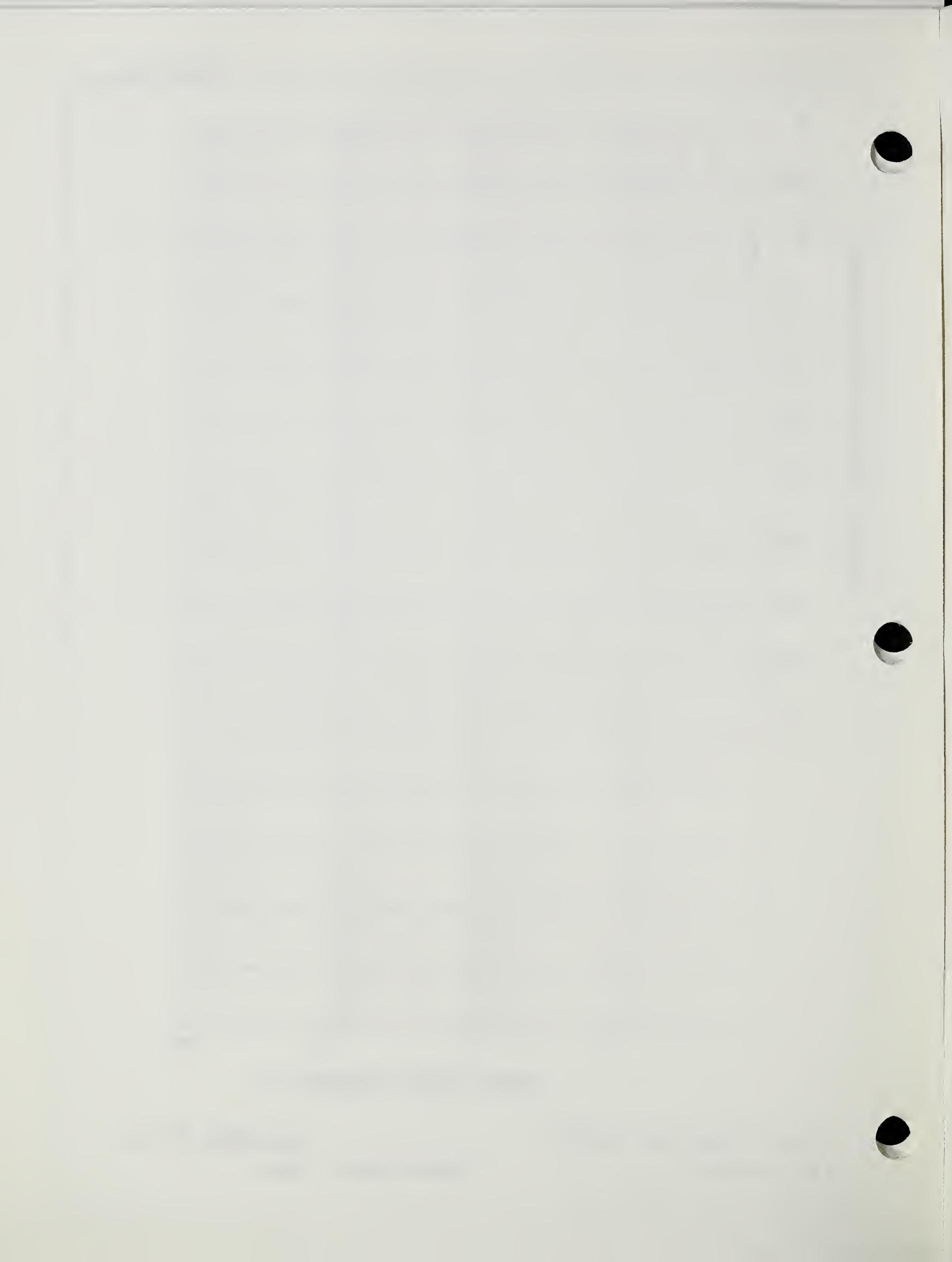
Project: ZAHL-NORTH DAKOTA

Field number:

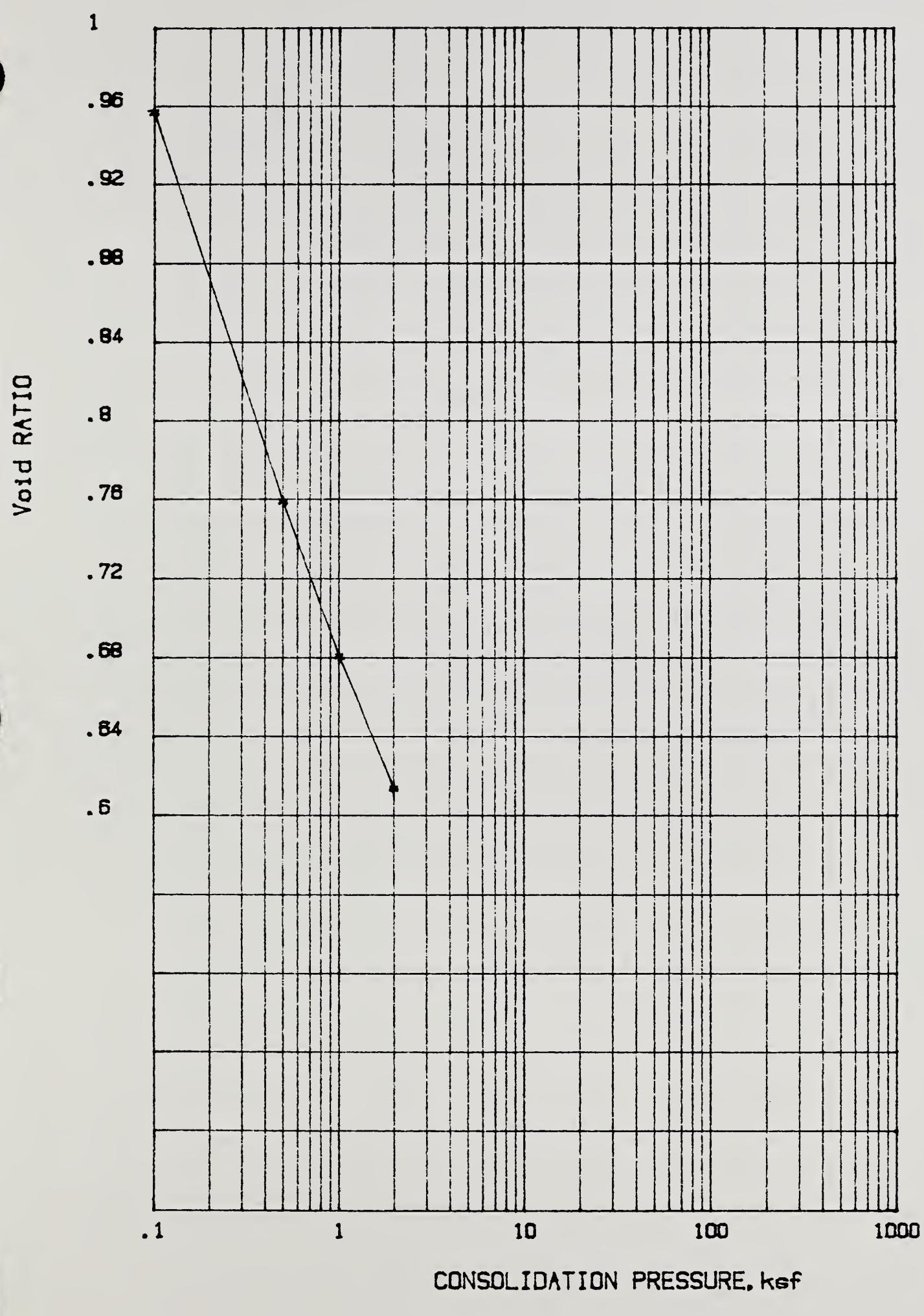
USDA-SCS S. M. L. LINCOLN NE.

LAB. NUMBER 88C106

Sample depth: Feet

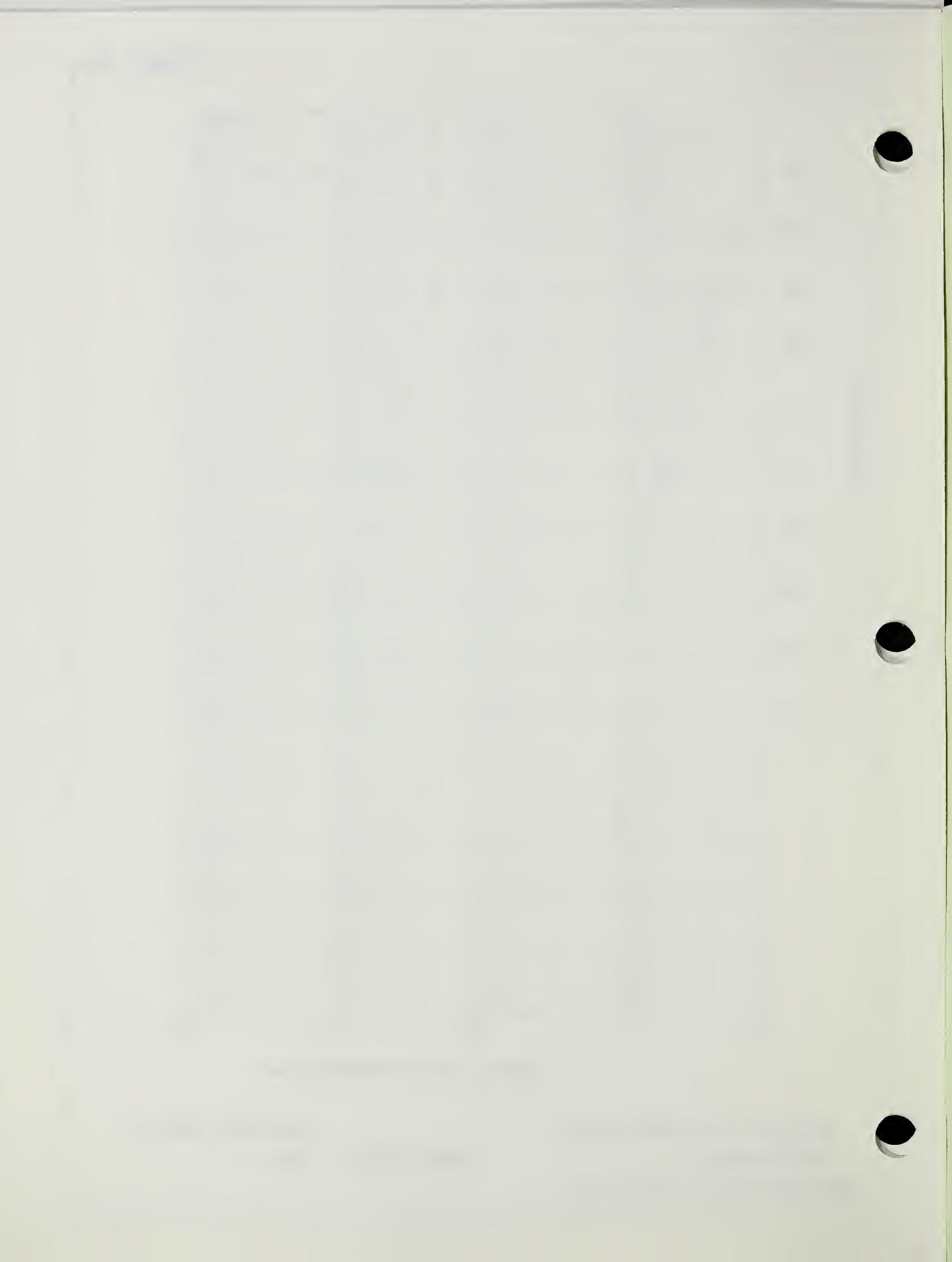


Test 2



Project: ZAHL-NORTH DAKOTA
Field number:
USDA-SCS S. M. L. LINCOLN NE.

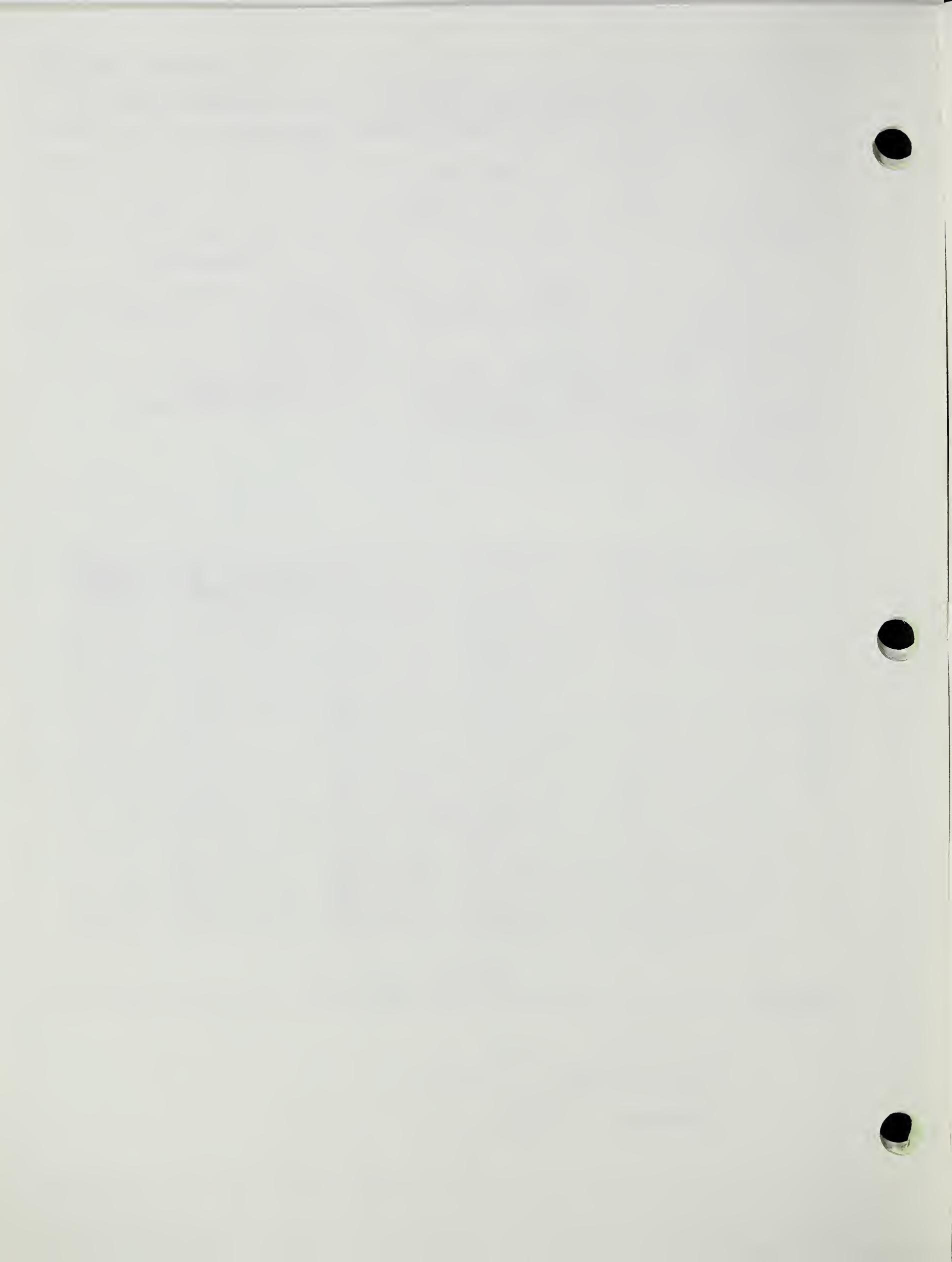
LAB. NUMBER 88C106
Sample depth: Feet



Permeability Data



MATERIALS TESTING REPORT		U. S. DEPARTMENT of AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY	
PROJECT and STATE <i>ABILENE - TEXAS</i>				SAMPLE LOCATION	
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE <i>Compacted</i>	TESTED AT <i>SML, Lincoln</i>	APPROVED BY			DATE
CLASSIFICATION <i>NON-Plastic SM LL PI</i>				SPECIFIC GRAVITY	
TEST NO.	<i>2000</i>	<i>4080</i>	<i>8000</i>	<i>4</i>	$G_s (-)^4$ <i>2.63</i>
INITIAL MOISTURE %					$G_s (+)^4$
DRY DENSITY <input type="checkbox"/> g/cc <input type="checkbox"/> pcf	<i>1.65</i>	<i>1.69</i>	<i>1.71</i>		$G_m(\text{Bulk})(+)^4$
VOID RATIO	<i>.5898</i>	<i>.5608</i>	<i>.5347</i>		TEST SPECIFICATIONS <i>Falling Head Perme.</i>
PERMEABILITY COEF FPD	<i>.25018</i>	<i>.16597</i>	<i>.08778</i>		
PERCOLATION COEF					
H/L DURING TEST					
<p>Graph showing the relationship between Void Ratio (e) and Permeability Coef (k_{fpd}). The Y-axis is labeled "VOID RATIO (e)" and ranges from 0.50 to 0.75. The X-axis is labeled "PERMEABILITY COEF (k) f_{pd}" and ranges from 0 to 600. A straight line is drawn through four data points, with handwritten calculations indicating $e_0 = 0.753$ and $k = 6 \text{ fpd}$.</p>					
REMARKS					
$e_0 = 0.753$ Volume Change = 12.5% K at $e_0 = 15 \text{ fpd}$					



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

WEPP - Academy - Fresno CA

SAMPLE LOCATION

FIELD SAMPLE NO.

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

TESTED AT

APPROVED BY

DATE

Remold

SML-Lincoln

CLASSIFICATION

NON-PLASTIC SM LL PI

SPECIFIC GRAVITY

TEST NO.

1

2

3

4

 $G_s (-)^4$

2.75

INITIAL MOISTURE %

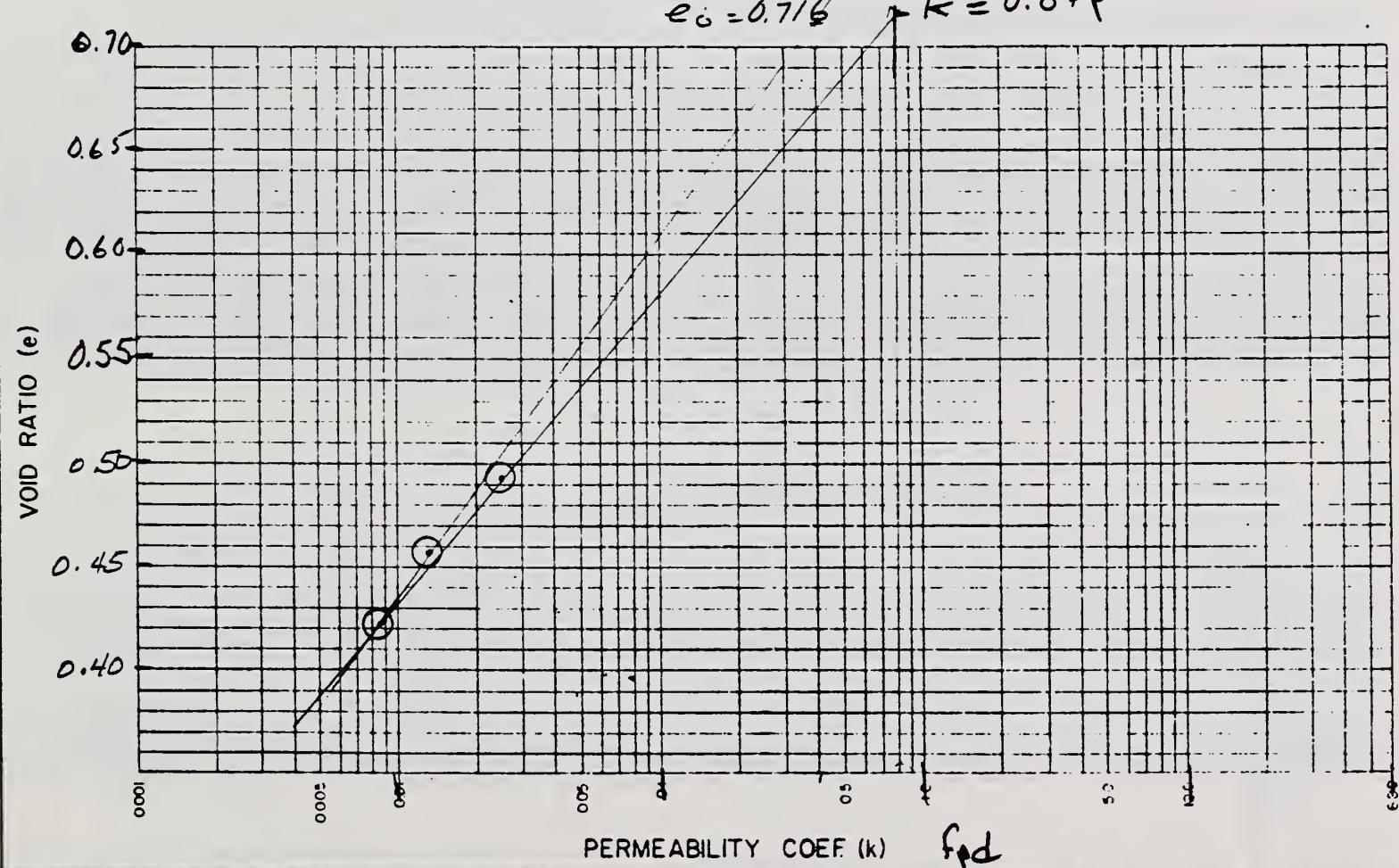
 $G_s (+)^4$ DRY DENSITY $\frac{\text{g/cc}}{\text{pcf}}$ $G_m (\text{Bulk}) (+)^4$

VOID RATIO

.4947 .4571 .4217

TEST SPECIFICATIONS
Falling Head PermsPERMEABILITY COEF $f.p.d.$, 0.2646, 0.1458, 0.00878

PERCOLATION COEF

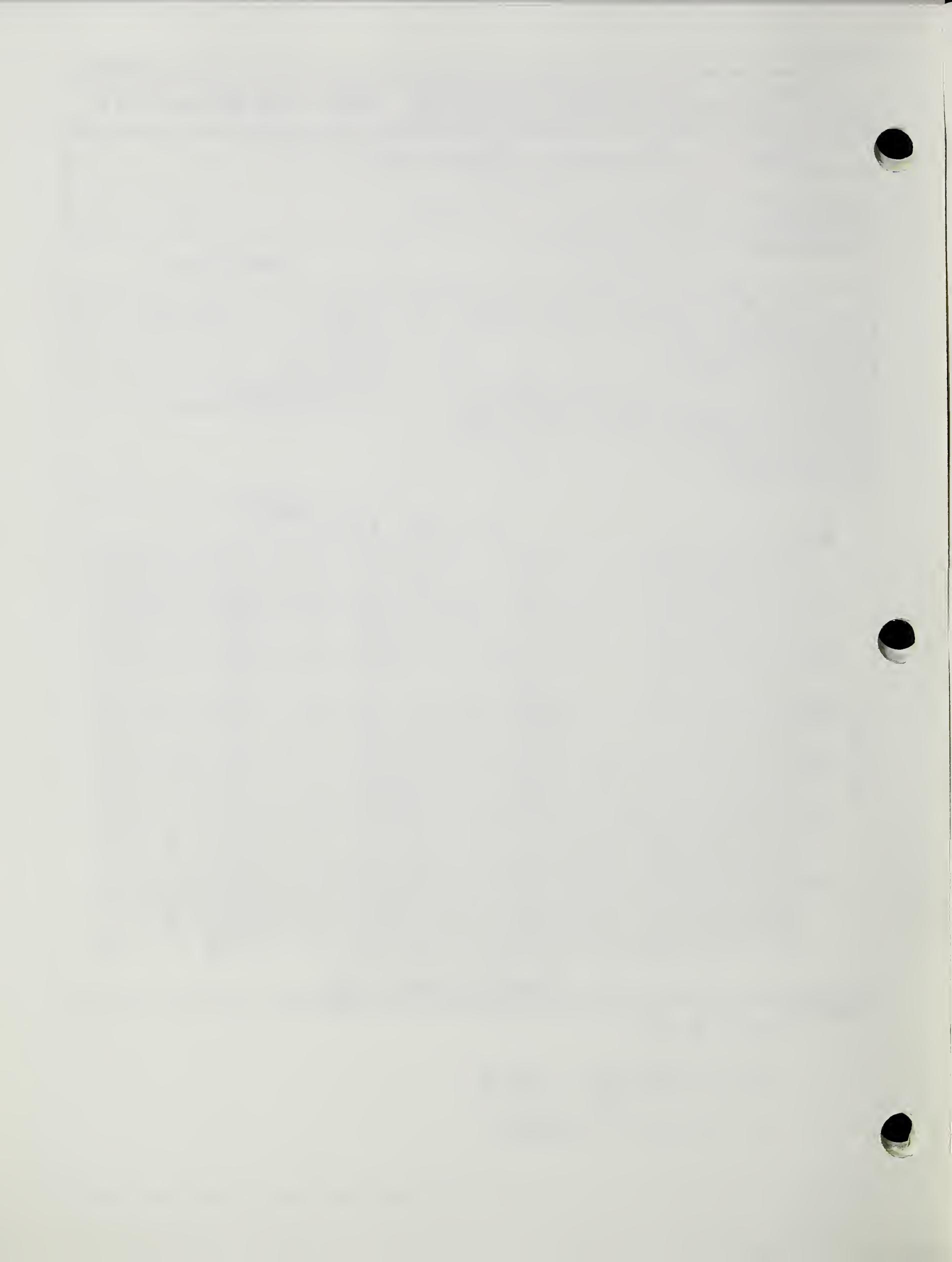
 H_L DURING TEST

REMARKS

$$e_0 = 0.716$$

$$\text{Volume Change} = 17.2\%$$

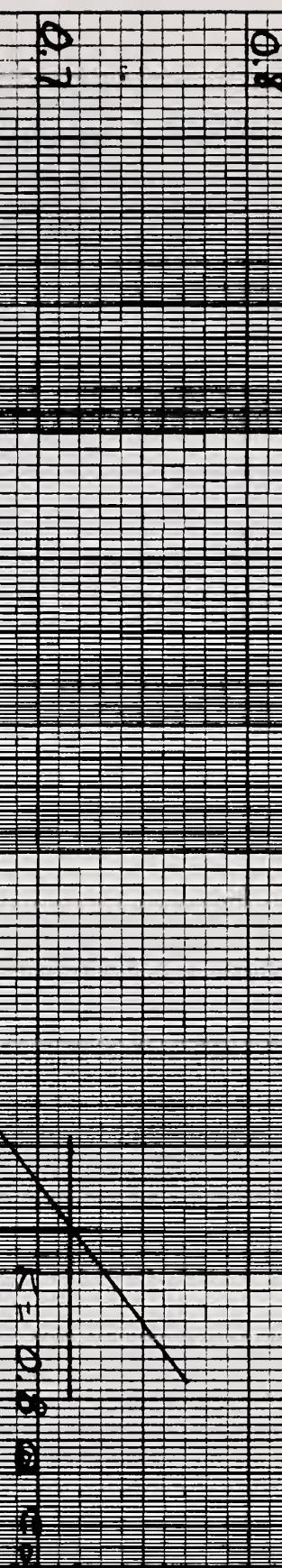
$$17 \text{ at } e_0 = 0.8 fpd$$



K+Σ

SEMI-LOGARITHMIC 359-91G
KEUFFEL & ESSER CO. MADE IN U. S. A.
5 CYCLES X 70 DIVISIONS

Anadamp 344 - France
2000 ft. 0 min.



Permeability Coef., K (GPD)



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

Wepp Barnes - Morris MN.

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

TESTED AT

APPROVED BY

DATE

CLASSIFICATION

CL LL 26 PI 9

SPECIFIC GRAVITY

TEST NO

2000

4000

8000

4

 $G_s (-)^* 4$

2.61

INITIAL MOISTURE %

 $G_s (+)^* 4$ DRY DENSITY g/cc
pcf $G_m (\text{Bulk}) (+)^* 4$

VOID RATIO

.6401 .5621 .4832

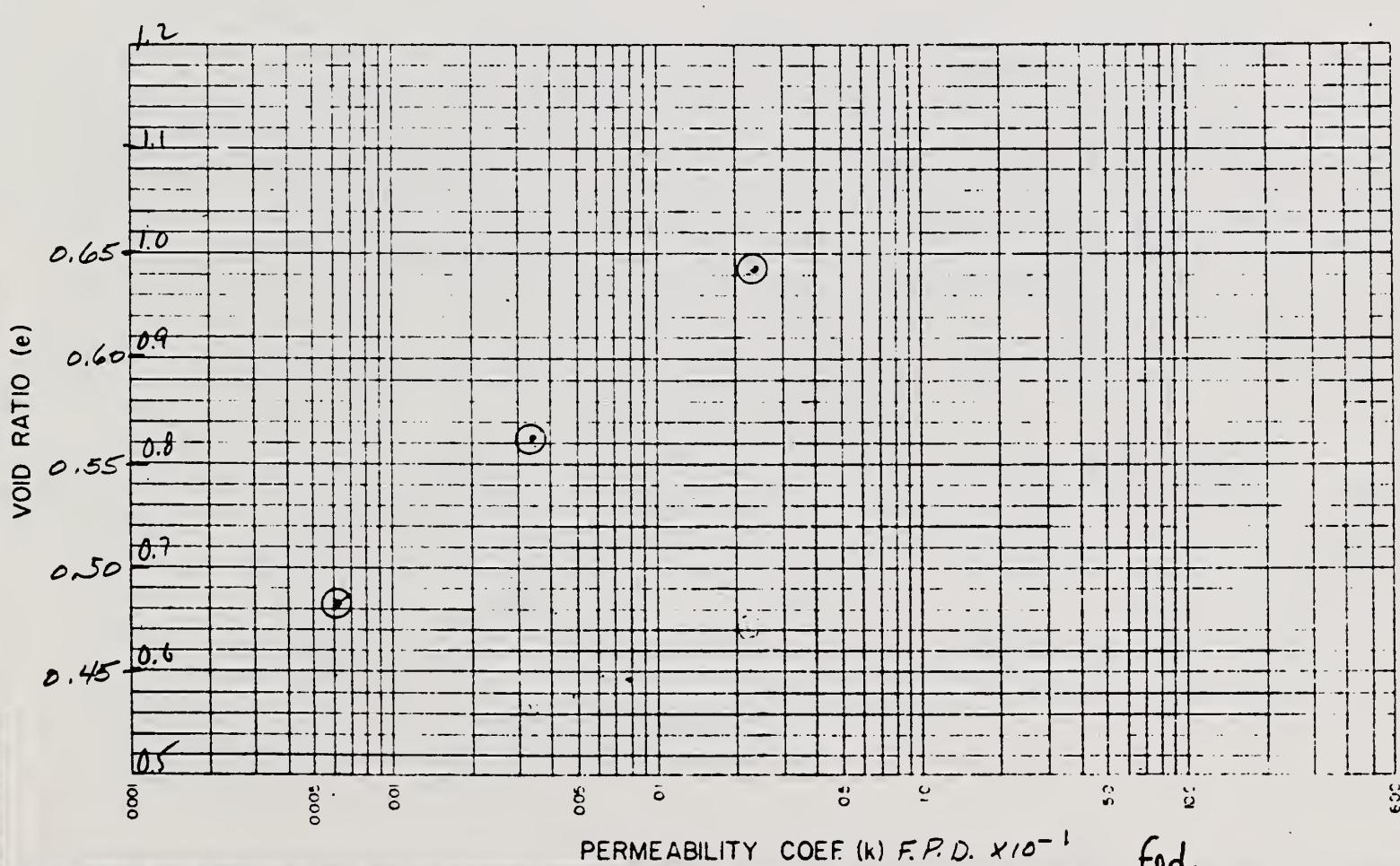
TEST SPECIFICATIONS

PERMEABILITY COEF F.P.D. 0.2300 .00349 .00061

Falling Head Perm

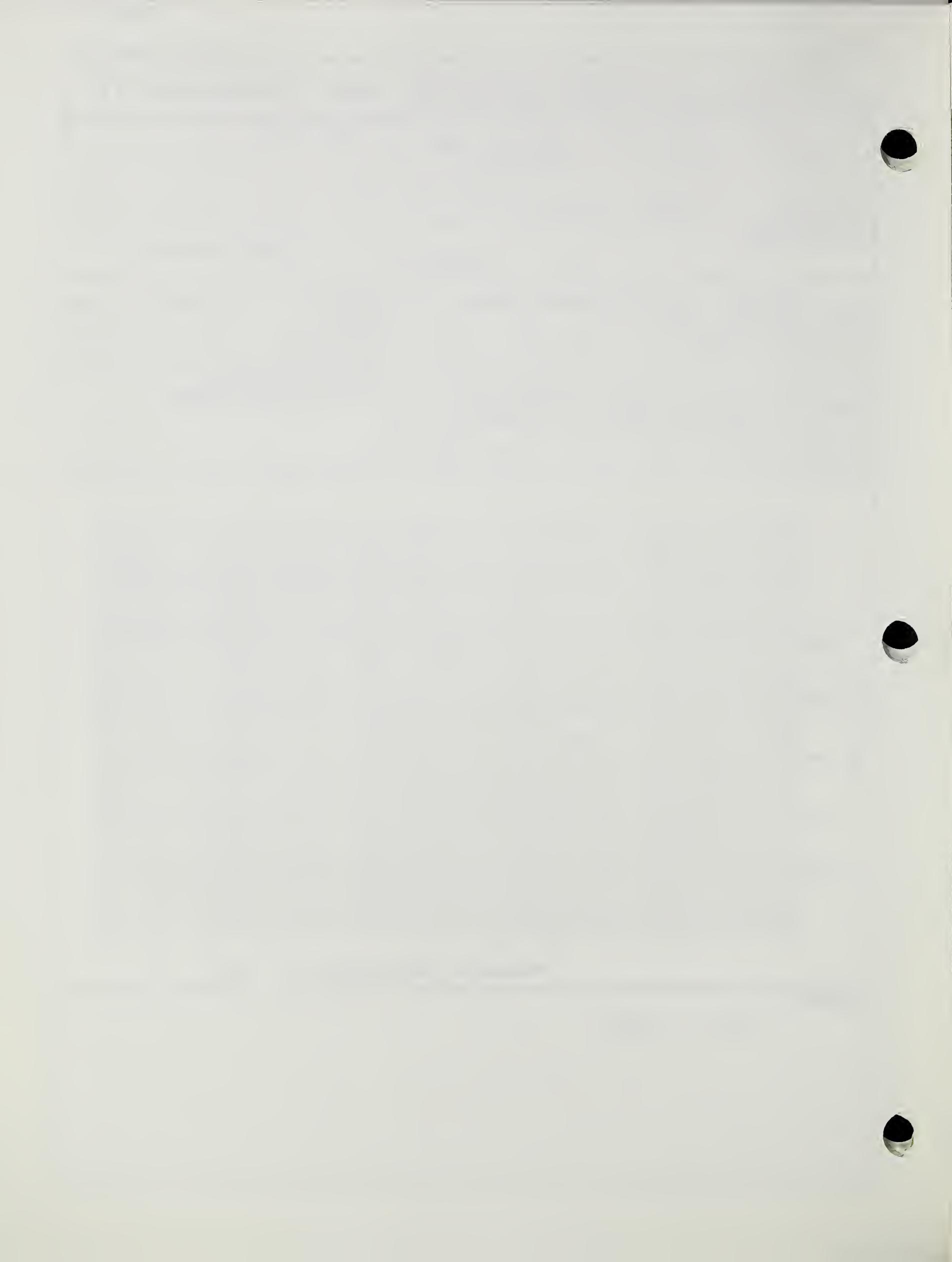
PERCOLATION COEF

H/L DURING TEST



REMARKS

 $C_0 = 1.273$



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

Wepp - Barnes Soil Morris MN

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE
Compacted

TESTED AT

SML, Lincoln

APPROVED BY

DATE

CLASSIFICATION

CL LL~~26~~ PI 9

SPECIFIC GRAVITY

TEST NO.

100

250

500

1000

~~G_s~~⁵₀₀₀^{#4}

2.61

INITIAL MOISTURE %

G_s(+)^{#4}DRY DENSITY g/cc pcf

1.30

1.39

1.44

1.51

~~P_d~~¹⁵⁸(+)^{#4}

VOID RATIO

1.0050

.8788

.8085

.7284

~~T_E~~^{15.35}

PERMEABILITY COEF. F.P.D.

1.3900

.39238

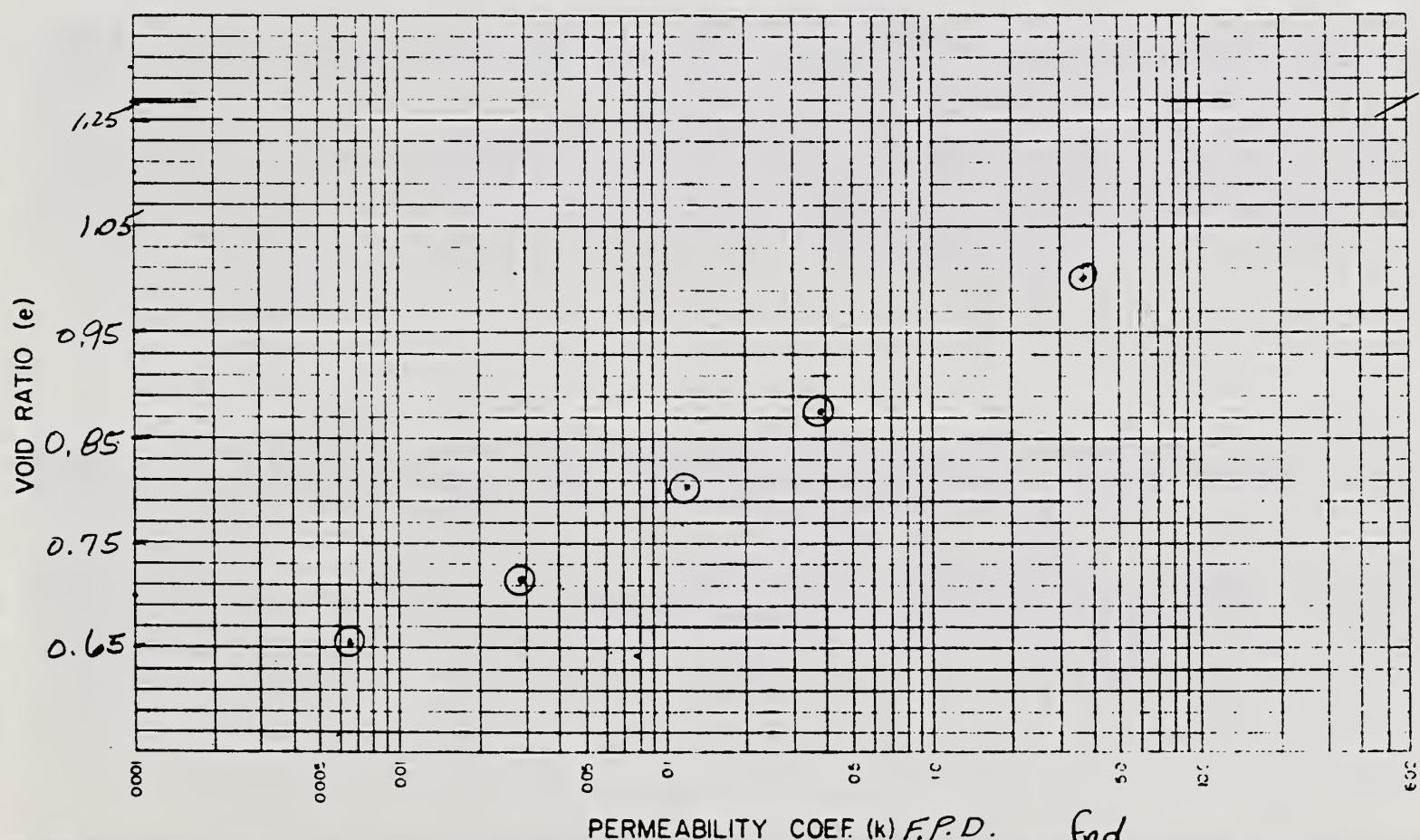
.12577

.02924

.00665

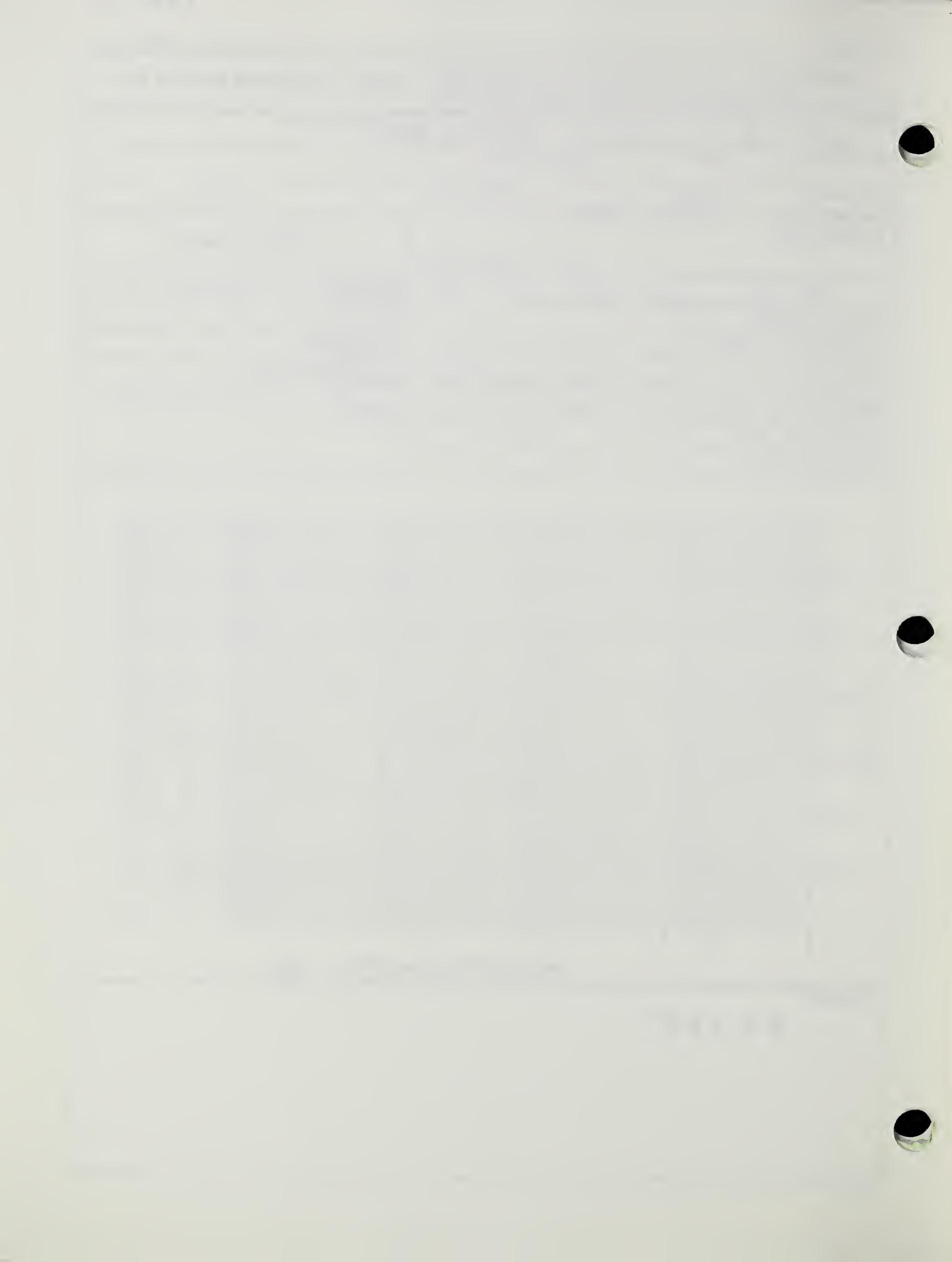
PERCOLATION COEF

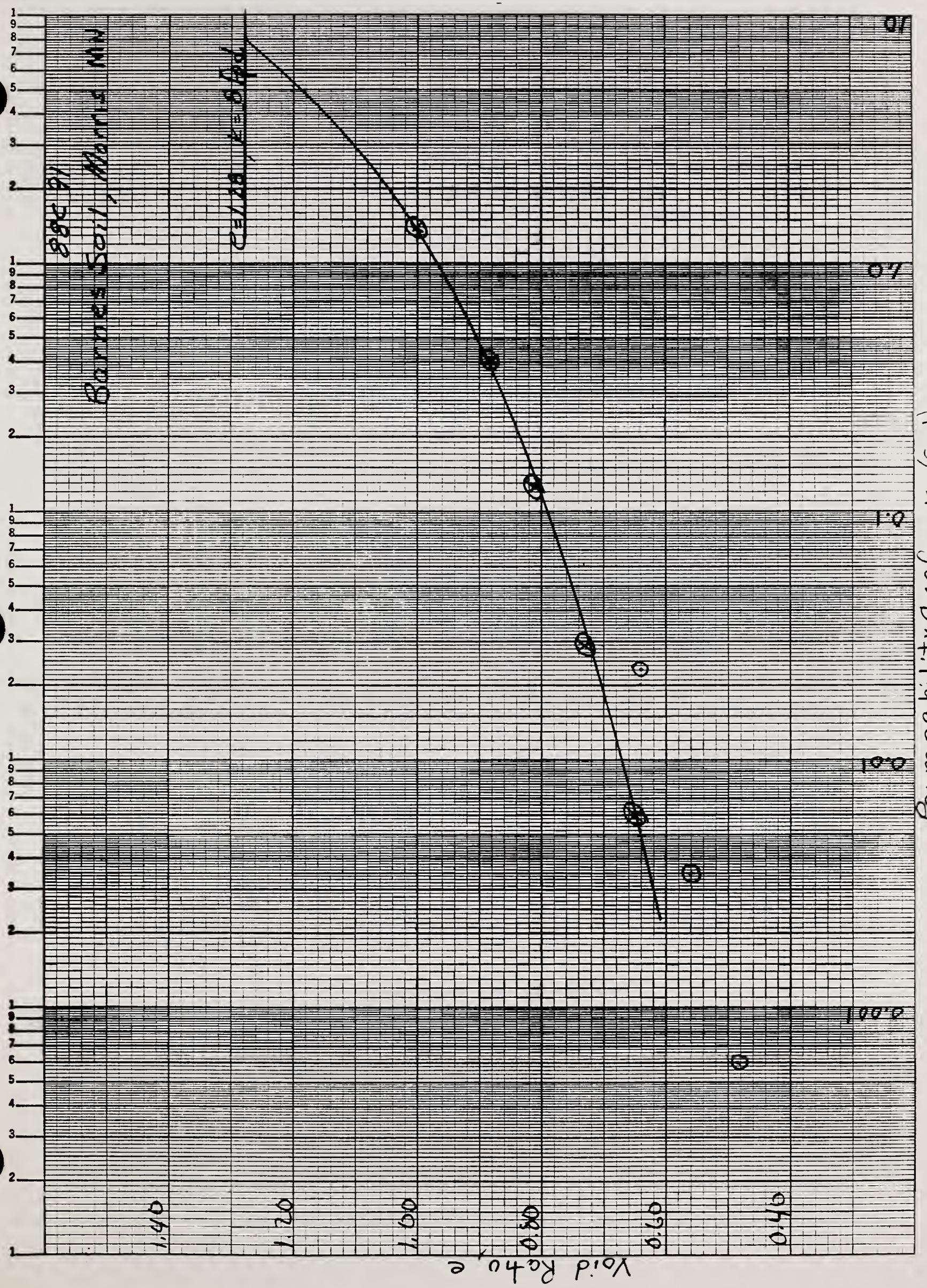
H/L DURING TEST

TEST SPECIFICATIONS
FALLING HEAD PERM.

REMARKS

 $e = 1.289$





K-E SEMI-LOGARITHMIC 358-91
KEUFFEL & ESSER CO. MADE IN U.S.A.
5 CYCLES X 70 DIVISIONS



Test 1

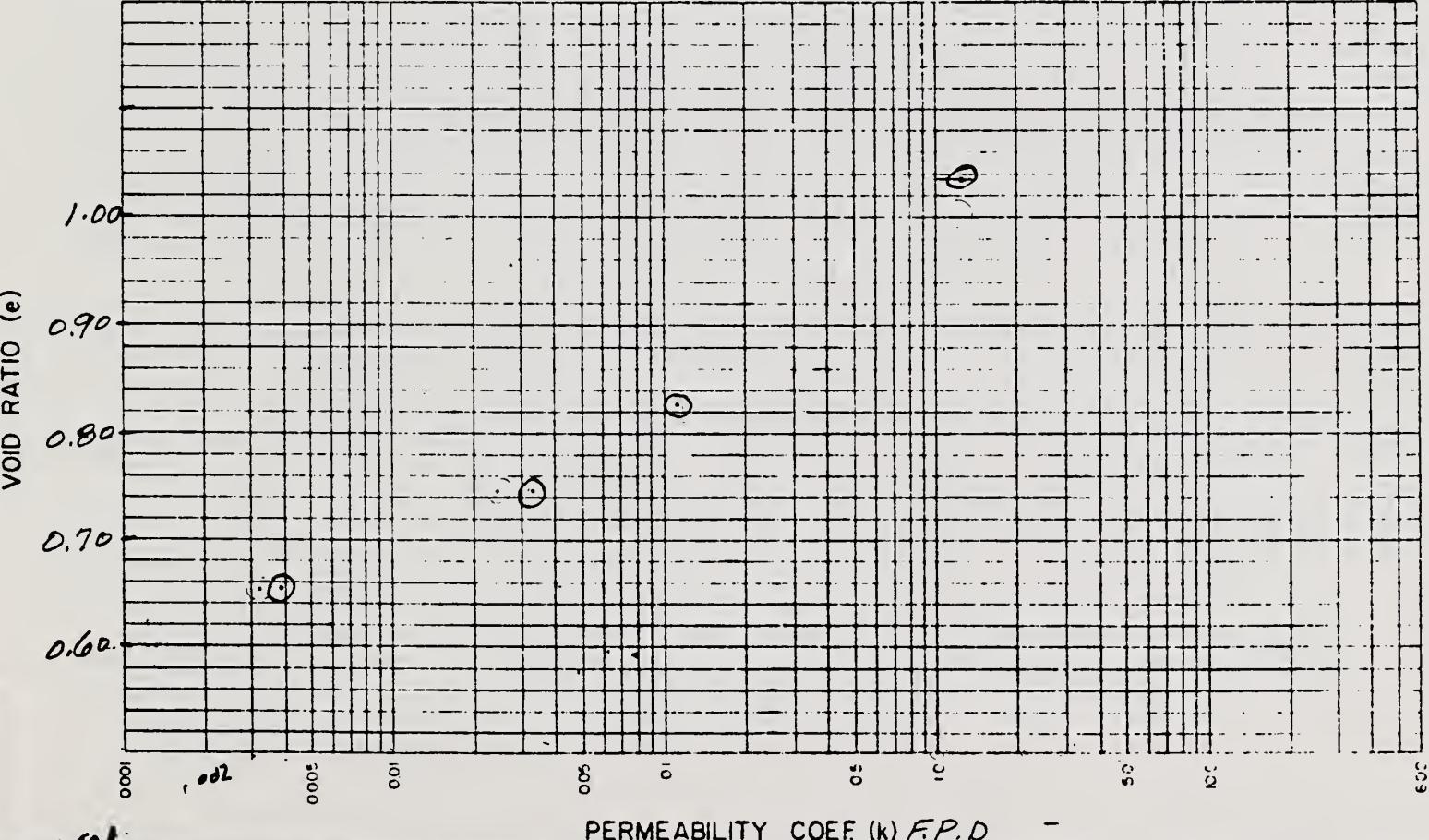
DATE 88C 92

SCS-ENG-127
REV. 6-72

MATERIALS TESTING REPORT		U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY	
PROJECT AND STATE WEPP Barnes McClusky ND.		SAMPLE LOCATION			
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE Remolded	TESTED AT SML, Lincoln	APPROVED BY			DATE
CLASSIFICATION				SPECIFIC GRAVITY	
TEST NO	2000	4800	8800	4	$G_s(-)^{\#4}$
INITIAL MOISTURE %					$G_s(+)^{\#4}$
DRY DENSITY <input type="checkbox"/> g/cc <input type="checkbox"/> pcf	1.44	1.49	1.59		$G_m(\text{Bulk})(+)^{\#4}$
VOID RATIO	.7652	.7086	.6012		TEST SPECIFICATIONS Falling Head Perm.
PERMEABILITY COEF. F.P.D.	.01224	.00330	.00073		
PERCOLATION COEF					
H _L DURING TEST					
<p>Y-axis: VOID RATIO (e) X-axis: PERMEABILITY COEF. (k) $\times 10^{-1}$</p>					
REMARKS $e_0 = 1.12$					



MATERIALS TESTING REPORT		U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY	
PROJECT AND STATE <i>We PP Barnes - McClusky, N.D.</i>				SAMPLE LOCATION	
FIELD SAMPLE NO.	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE <i>Compacted</i>	TESTED AT <i>SML, Lincoln</i>	APPROVED BY			DATE
CLASSIFICATION <i>CL LL 31 PI 12</i>				SPECIFIC GRAVITY	
TEST NO.	100	500	1000	2000	$G_s (-)^{\#4}$
INITIAL MOISTURE %					$G_s (+)^{\#4}$
DRY DENSITY <input type="checkbox"/> g/cc <input type="checkbox"/> pcf	1.25	1.40	1.46	1.54	$G_m(\text{Bulk})(+)^{\#4}$
VOID RATIO	1.0347	1.8275	1.7449	1.6554	TEST SPECIFICATIONS <i>Fall, 29 Head Perm.</i>
PERMEABILITY COEF F.P.D.	1.3362	1.2863	0.3330	0.0394	
PERCOLATION COEF					
H/L DURING TEST					



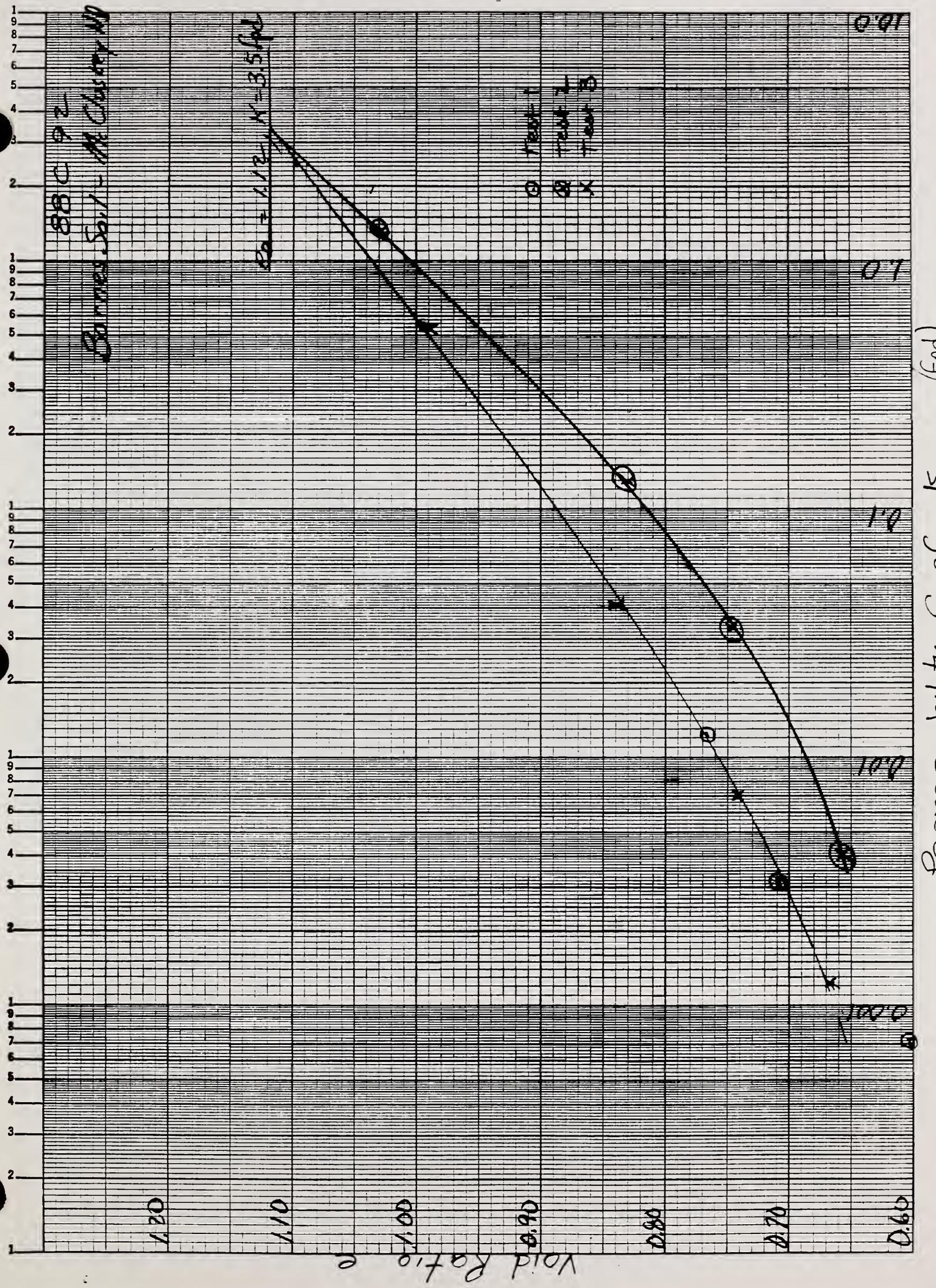
REMARKS
 $e_0 = 1.125$



MATERIALS TESTING REPORT		U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY	
PROJECT AND STATE <u>We PP - Barnes - McClusky, ND.</u>		SAMPLE LOCATION			
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE <u>Compacted</u>	TESTED AT <u>SML - Lincoln</u>	APPROVED BY			DATE
CLASSIFICATION <u>CL LL 31 PI 12</u>				SPECIFIC GRAVITY	
TEST NO.	<u>100</u>	<u>580</u>	<u>1080</u>	<u>2000</u>	<u>G_s (-) #4</u>
INITIAL MOISTURE %					<u>2.55</u>
DRY DENSITY □ g/cc □pcf	<u>1.28</u>	<u>1.38</u>	<u>1.46</u>	<u>1.53</u>	<u>G_m(Bulk)(+) #4</u>
VOID RATIO	<u>.9928</u>	<u>.8945</u>	<u>.7427</u>	<u>.6643</u>	TEST SPECIFICATIONS <u>Falling Head Perm.</u>
PERMEABILITY COEF. F.P.D.	<u>.53575</u>	<u>.04086</u>	<u>.00726</u>	<u>.00125</u>	
PERCOLATION COEF					
H/L DURING TEST					
REMARKS <u>C_o = 1.125</u>					

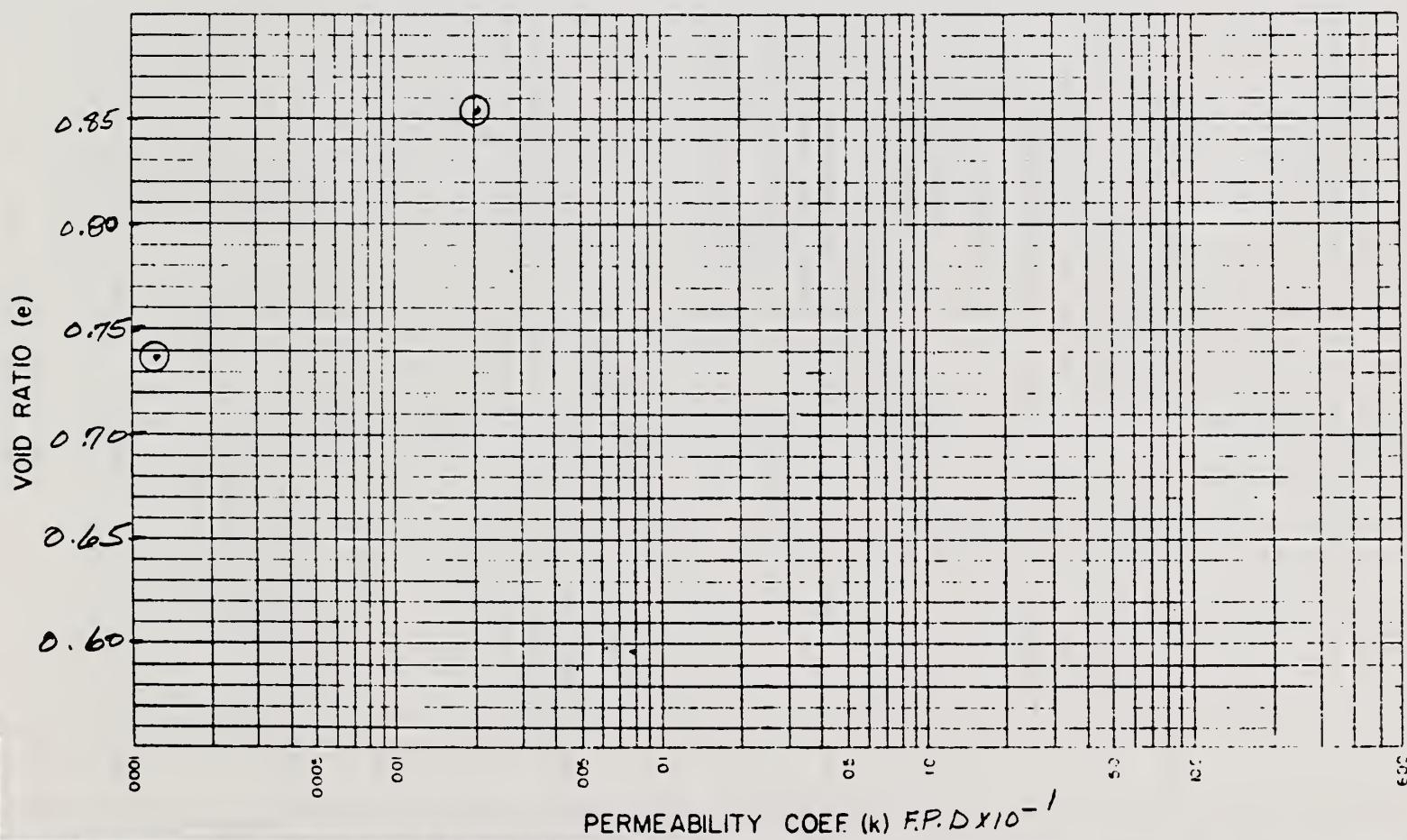


K-E SEMI-LOGARITHMIC
KEUFFEL & ESSER CO. MADE IN U.S.A.
5 CYCLES X 70 DIVISIONS





MATERIALS TESTING REPORT		U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY		
PROJECT AND STATE WEPP HEIDEN WACO TX.				SAMPLE LOCATION		
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN				
TYPE OF SAMPLE	TESTED AT SML, Lincoln	APPROVED BY		DATE		
CLASSIFICATION				SPECIFIC GRAVITY		
TEST NO	2000	4000	8000	4	$G_s (-)^{\#4}$	2.67
INITIAL MOISTURE %					$G_s (+)^{\#4}$	
DRY DENSITY <input type="checkbox"/> g/cc <input type="checkbox"/> pcf	1.44	1.54	1.63		$G_m (\text{Bulk}) (+)^{\#4}$	
VOID RATIO	.8523	.7378	.6411		TEST SPECIFICATIONS Falling Head Permn.	
PERMEABILITY COEF F.P.D. FPD	.00216	.00012	.00000			
PERCOLATION COEF						
H/L DURING TEST						



REMARKS
$e_0 = 1.693$



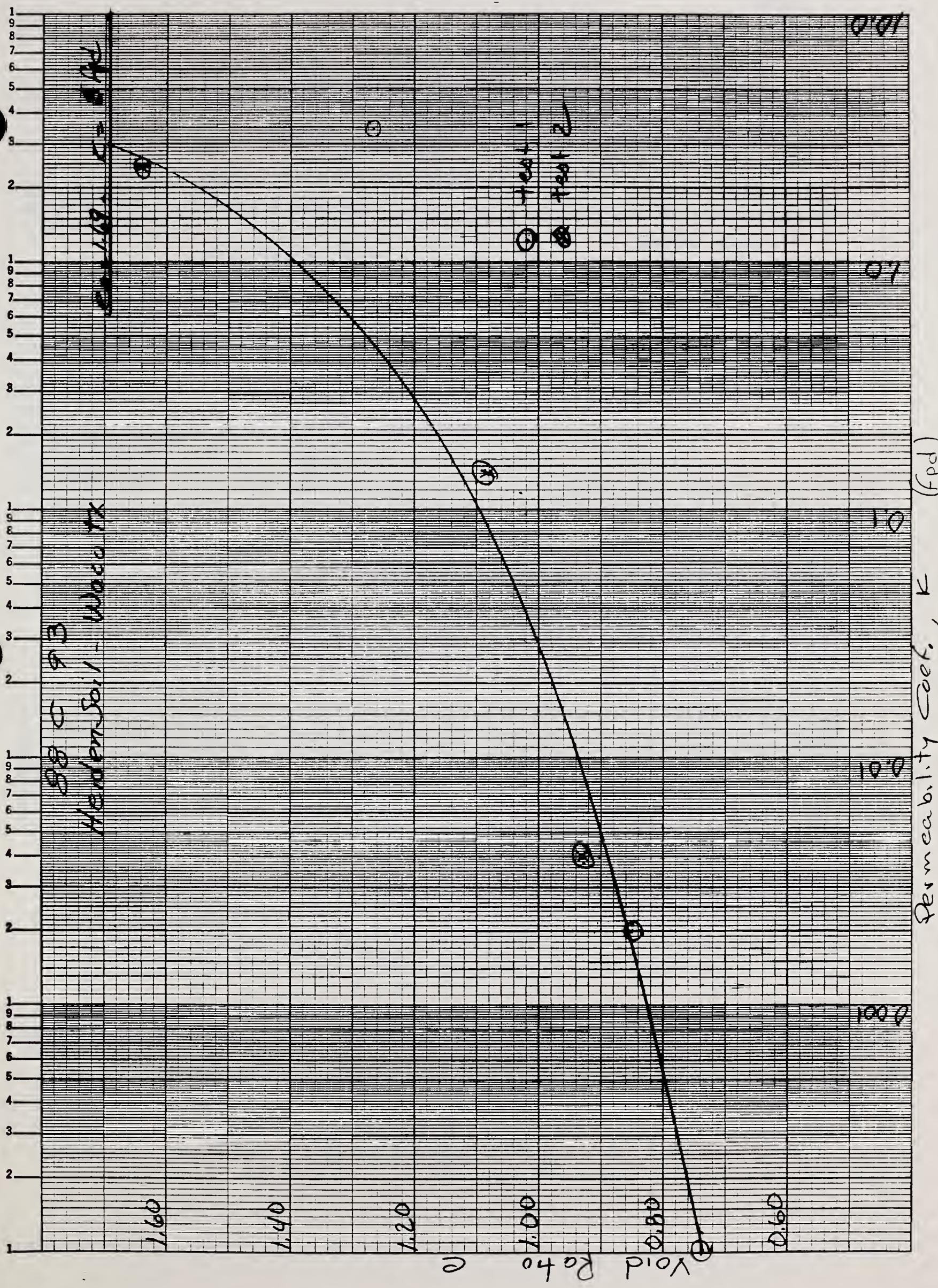
1

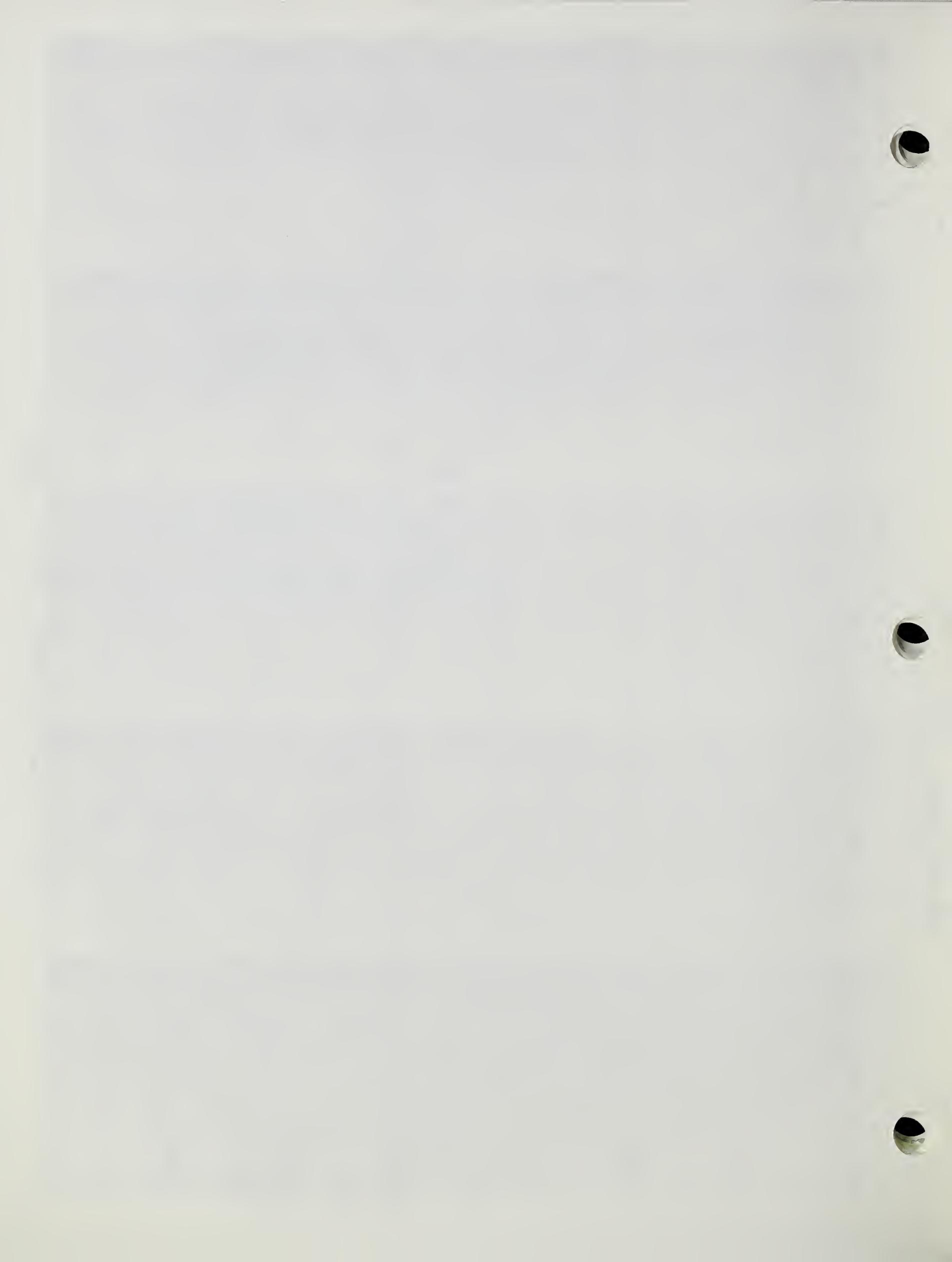


MATERIALS TESTING REPORT		U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY	
PROJECT AND STATE <i>WePP - Heiden - Waco, TX.</i>		SAMPLE LOCATION			
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE <i>Compacted</i>	TESTED AT <i>SML, Lincoln</i>	APPROVED BY			DATE
CLASSIFICATION		SPECIFIC GRAVITY			
TEST NO	100	500	1000	2000	$G_s (-)^{\#4}$ $G_s (+)^{\#4}$
INITIAL MOISTURE %					2.67
DRY DENSITY <input type="checkbox"/> g/cc <input type="checkbox"/> pcf	1.01	1.18	1.28	1.39	$G_m (\text{Bulk}) (+)^{\#4}$
VOID RATIO	1.6444	1.2679	1.0826	.9275	TEST SPECIFICATIONS <i>Falling Head F2rm</i>
PERMEABILITY COEF. F.P.D.	2.4032	3.4354	1.4607	.00366	
PERCOLATION COEF					
H _L DURING TEST					
<img alt="Graph showing Void Ratio (e) vs Permeability Coefficient (k) F.P.D. The graph has a grid with major ticks at 0.00, 0.05, 0.10, 0.15, 0.20, 0.25, 0.30, 0.35, 0.40, 0.45, 0.50, 0.55, 0.60, 0.65, 0.70, 0.75, 0.80, 0.85, 0.90, 0.95, 1.00, 1.05, 1.10, 1.15, 1.20, 1.25, 1.30, 1.35, 1.40, 1.45, 1.50, 1.55, 1.60, 1.65, 1.70, 1.75, 1.80, 1.85, 1.90, 1.95, 2.00, 2.05, 2.10, 2.15, 2.20, 2.25, 2.30, 2.35, 2.40, 2.45, 2.50, 2.55, 2.60, 2.65, 2.70, 2.75, 2.80, 2.85, 2.90, 2.95, 3.00, 3.05, 3.10, 3.15, 3.20, 3.25, 3.30, 3.35, 3.40, 3.45, 3.50, 3.55, 3.60, 3.65, 3.70, 3.75, 3.80, 3.85, 3.90, 3.95, 4.00, 4.05, 4.10, 4.15, 4.20, 4.25, 4.30, 4.35, 4.40, 4.45, 4.50, 4.55, 4.60, 4.65, 4.70, 4.75, 4.80, 4.85, 4.90, 4.95, 5.00, 5.05, 5.10, 5.15, 5.20, 5.25, 5.30, 5.35, 5.40, 5.45, 5.50, 5.55, 5.60, 5.65, 5.70, 5.75, 5.80, 5.85, 5.90, 5.95, 6.00, 6.05, 6.10, 6.15, 6.20, 6.25, 6.30, 6.35, 6.40, 6.45, 6.50, 6.55, 6.60, 6.65, 6.70, 6.75, 6.80, 6.85, 6.90, 6.95, 7.00, 7.05, 7.10, 7.15, 7.20, 7.25, 7.30, 7.35, 7.40, 7.45, 7.50, 7.55, 7.60, 7.65, 7.70, 7.75, 7.80, 7.85, 7.90, 7.95, 8.00, 8.05, 8.10, 8.15, 8.20, 8.25, 8.30, 8.35, 8.40, 8.45, 8.50, 8.55, 8.60, 8.65, 8.70, 8.75, 8.80, 8.85, 8.90, 8.95, 9.00, 9.05, 9.10, 9.15, 9.20, 9.25, 9.30, 9.35, 9.40, 9.45, 9.50, 9.55, 9.60, 9.65, 9.70, 9.75, 9.80, 9.85, 9.90, 9.95, 10.00, 10.05, 10.10, 10.15, 10.20, 10.25, 10.30, 10.35, 10.40, 10.45, 10.50, 10.55, 10.60, 10.65, 10.70, 10.75, 10.80, 10.85, 10.90, 10.95, 11.00, 11.05, 11.10, 11.15, 11.20, 11.25, 11.30, 11.35, 11.40, 11.45, 11.50, 11.55, 11.60, 11.65, 11.70, 11.75, 11.80, 11.85, 11.90, 11.95, 12.00, 12.05, 12.10, 12.15, 12.20, 12.25, 12.30, 12.35, 12.40, 12.45, 12.50, 12.55, 12.60, 12.65, 12.70, 12.75, 12.80, 12.85, 12.90, 12.95, 13.00, 13.05, 13.10, 13.15, 13.20, 13.25, 13.30, 13.35, 13.40, 13.45, 13.50, 13.55, 13.60, 13.65, 13.70, 13.75, 13.80, 13.85, 13.90, 13.95, 14.00, 14.05, 14.10, 14.15, 14.20, 14.25, 14.30, 14.35, 14.40, 14.45, 14.50, 14.55, 14.60, 14.65, 14.70, 14.75, 14.80, 14.85, 14.90, 14.95, 15.00, 15.05, 15.10, 15.15, 15.20, 15.25, 15.30, 15.35, 15.40, 15.45, 15.50, 15.55, 15.60, 15.65, 15.70, 15.75, 15.80, 15.85, 15.90, 15.95, 16.00, 16.05, 16.10, 16.15, 16.20, 16.25, 16.30, 16.35, 16.40, 16.45, 16.50, 16.55, 16.60, 16.65, 16.70, 16.75, 16.80, 16.85, 16.90, 16.95, 17.00, 17.05, 17.10, 17.15, 17.20, 17.25, 17.30, 17.35, 17.40, 17.45, 17.50, 17.55, 17.60, 17.65, 17.70, 17.75, 17.80, 17.85, 17.90, 17.95, 18.00, 18.05, 18.10, 18.15, 18.20, 18.25, 18.30, 18.35, 18.40, 18.45, 18.50, 18.55, 18.60, 18.65, 18.70, 18.75, 18.80, 18.85, 18.90, 18.95, 19.00, 19.05, 19.10, 19.15, 19.20, 19.25, 19.30, 19.35, 19.40, 19.45, 19.50, 19.55, 19.60, 19.65, 19.70, 19.75, 19.80, 19.85, 19.90, 19.95, 20.00, 20.05, 20.10, 20.15, 20.20, 20.25, 20.30, 20.35, 20.40, 20.45, 20.50, 20.55, 20.60, 20.65, 20.70, 20.75, 20.80, 20.85, 20.90, 20.95, 21.00, 21.05, 21.10, 21.15, 21.20, 21.25, 21.30, 21.35, 21.40, 21.45, 21.50, 21.55, 21.60, 21.65, 21.70, 21.75, 21.80, 21.85, 21.90, 21.95, 22.00, 22.05, 22.10, 22.15, 22.20, 22.25, 22.30, 22.35, 22.40, 22.45, 22.50, 22.55, 22.60, 22.65, 22.70, 22.75, 22.80, 22.85, 22.90, 22.95, 23.00, 23.05, 23.10, 23.15, 23.20, 23.25, 23.30, 23.35, 23.40, 23.45, 23.50, 23.55, 23.60, 23.65, 23.70, 23.75, 23.80, 23.85, 23.90, 23.95, 24.00, 24.05, 24.10, 24.15, 24.20, 24.25, 24.30, 24.35, 24.40, 24.45, 24.50, 24.55, 24.60, 24.65, 24.70, 24.75, 24.80, 24.85, 24.90, 24.95, 25.00, 25.05, 25.10, 25.15, 25.20, 25.25, 25.30, 25.35, 25.40, 25.45, 25.50, 25.55, 25.60, 25.65, 25.70, 25.75, 25.80, 25.85, 25.90, 25.95, 26.00, 26.05, 26.10, 26.15, 26.20, 26.25, 26.30, 26.35, 26.40, 26.45, 26.50, 26.55, 26.60, 26.65, 26.70, 26.75, 26.80, 26.85, 26.90, 26.95, 27.00, 27.05, 27.10, 27.15, 27.20, 27.25, 27.30, 27.35, 27.40, 27.45, 27.50, 27.55, 27.60, 27.65, 27.70, 27.75, 27.80, 27.85, 27.90, 27.95, 28.00, 28.05, 28.10, 28.15, 28.20, 28.25, 28.30, 28.35, 28.40, 28.45, 28.50, 28.55, 28.60, 28.65, 28.70, 28.75, 28.80, 28.85, 28.90, 28.95, 29.00, 29.05, 29.10, 29.15, 29.20, 29.25, 29.30, 29.35, 29.40, 29.45, 29.50, 29.55, 29.60, 29.65, 29.70, 29.75, 29.80, 29.85, 29.90, 29.95, 30.00, 30.05, 30.10, 30.15, 30.20, 30.25, 30.30, 30.35, 30.40, 30.45, 30.50, 30.55, 30.60, 30.65, 30.70, 30.75, 30.80, 30.85, 30.90, 30.95, 31.00, 31.05, 31.10, 31.15, 31.20, 31.25, 31.30, 31.35, 31.40, 31.45, 31.50, 31.55, 31.60, 31.65, 31.70, 31.75, 31.80, 31.85, 31.90, 31.95, 32.00, 32.05, 32.10, 32.15, 32.20, 32.25, 32.30, 32.35, 32.40, 32.45, 32.50, 32.55, 32.60, 32.65, 32.70, 32.75, 32.80, 32.85, 32.90, 32.95, 33.00, 33.05, 33.10, 33.15, 33.20, 33.25, 33.30, 33.35, 33.40, 33.45, 33.50, 33.55, 33.60, 33.65, 33.70, 33.75, 33.80, 33.85, 33.90, 33.95, 34.00, 34.05, 34.10, 34.15, 34.20, 34.25, 34.30, 34.35, 34.40, 34.45, 34.50, 34.55, 34.60, 34.65, 34.70, 34.75, 34.80, 34.85, 34.90, 34.95, 35.00, 35.05, 35.10, 35.15, 35.20, 35.25, 35.30, 35.35, 35.40, 35.45, 35.50, 35.55, 35.60, 35.65, 35.70, 35.75, 35.80, 35.85, 35.90, 35.95, 36.00, 36.05, 36.10, 36.15, 36.20, 36.25, 36.30, 36.35, 36.40, 36.45, 36.50, 36.55, 36.60, 36.65, 36.70, 36.75, 36.80, 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58.30, 58.35, 58.40, 58.45, 58.50, 58.55, 58.60, 58.65, 58.70, 58.75, 58.80, 58.85, 58.90, 58.95, 59.00, 59.05, 59.10, 59.15, 59.20, 59.25, 59.30, 59.35, 59.40, 59.45, 59.50, 59.55, 59.60, 59.65, 59.70, 59.75, 59.80, 59.85, 59.90, 59.95, 60.00, 60.05, 60.10, 60.15, 60.20, 60.25, 60.30, 60.35, 60.40, 60.45, 60.50, 60.55, 60.60, 60.65, 60.70, 60.75, 60.80, 60.85, 60.90, 60.95, 61.00, 61.05, 61.10, 61.15, 61.20, 61.25, 61.30, 61.35, 61.40, 61.45, 61.50, 61.55, 61.60, 61.65, 61.70, 61.75, 61.80, 61.85, 61.90, 61.95, 62.00, 62.05, 62.10, 62.15, 62.20, 62.25, 62.30, 62.35, 62.40, 62.45, 62.50, 62.55, 62.60, 62.65, 62.70, 62.75, 62.80, 62.					

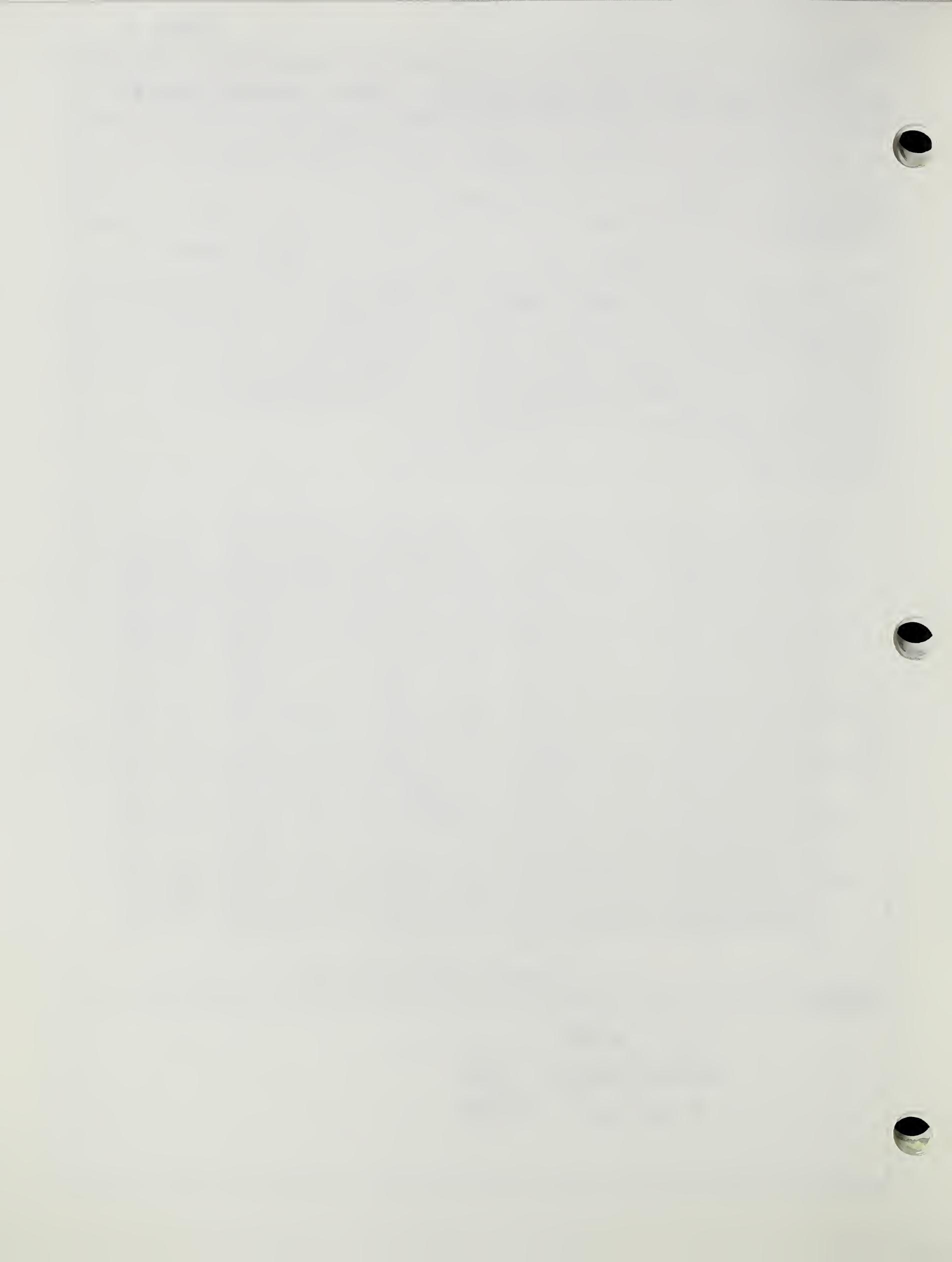


K-E SEMI-LOGARITHMIC 358-91
KEUFFEL & ESSER CO. MADE IN U.S.A.
5 CYCLES X 70 DIVISIONS





MATERIALS TESTING REPORT		U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY	
PROJECT AND STATE WePP		Hirsh		ORD NE.	SAMPLE LOCATION Hirsh - Ord, Ne.
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE Compacted	TESTED AT SMU, Lincoln	APPROVED BY			DATE
CLASSIFICATION NON-Plastic SM LL PI				SPECIFIC GRAVITY	
TEST NO	2000	4000	8000	4	$G_s (-)^{\#4}$
INITIAL MOISTURE %					$G_s (+)^{\#4}$
DRY DENSITY <input type="checkbox"/> g/cc <input type="checkbox"/> pcf	1.65	1.67	1.69		$G_m (\text{Bulk}) (+)^{\#4}$
VOID RATIO	.6065	.5788	.5517		TEST SPECIFICATIONS Falling Head Perm.
PERMEABILITY COEF F.P.D. 7022	5217	3549			
PERCOLATION COEF					
H _L DURING TEST					
<p>Graph showing void ratio (e) versus permeability coefficient ($k \times 10^{-6}$). The x-axis ranges from 0 to 1500, and the y-axis ranges from 0.50 to 0.75. Three data points are plotted at approximately (600, 0.55), (700, 0.58), and (1000, 0.60).</p>					
<p>REMARKS</p> $e_0 = 0.894$ $\text{Volume Change} = 18\%$ $K \text{ at } e_0 \approx 40 \text{ fpm}$					



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

WEPP - Hirsh - Ord, NE

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

TESTED AT

APPROVED BY

DATE

CLASSIFICATION

NON-PLASTIC SMCL PI

SPECIFIC GRAVITY

TEST NO.

100

500

1000

2000

 $G_s (-)^4$

2.63

INITIAL MOISTURE %

 $G_s (+)^4$ DRY DENSITY g/cc pcf

1.57

1.64

1.69

1.72

 $G_m(\text{bulk}) (+)^4$

VOID RATIO

.6720

.6014

.5585

.5295

PERMEABILITY COEFF. F.P.D.

1.4394

.9671

.31716

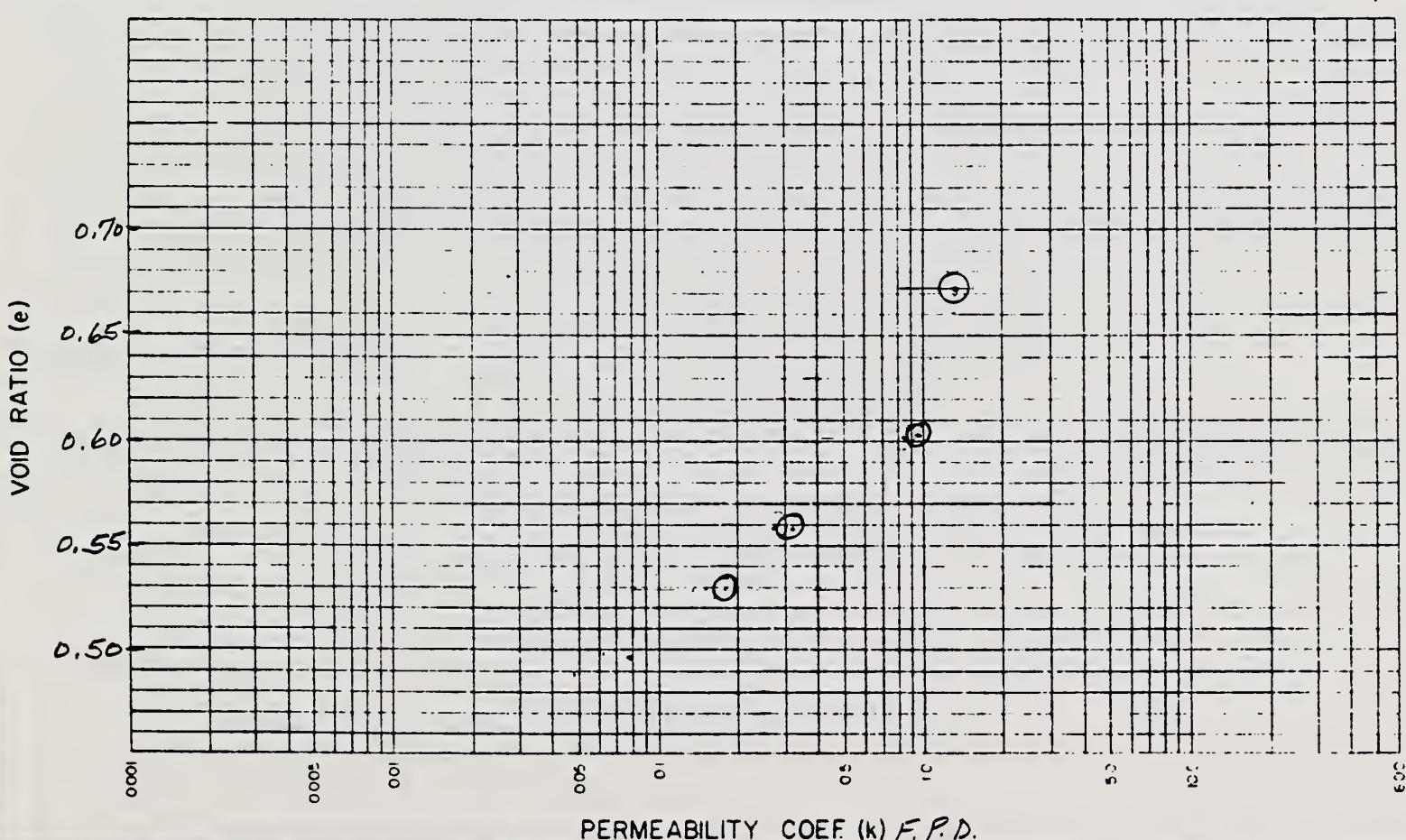
.18705

PERCOLATION COEF

H/L DURING TEST

TEST SPECIFICATIONS

Falling Head Perm



REMARKS

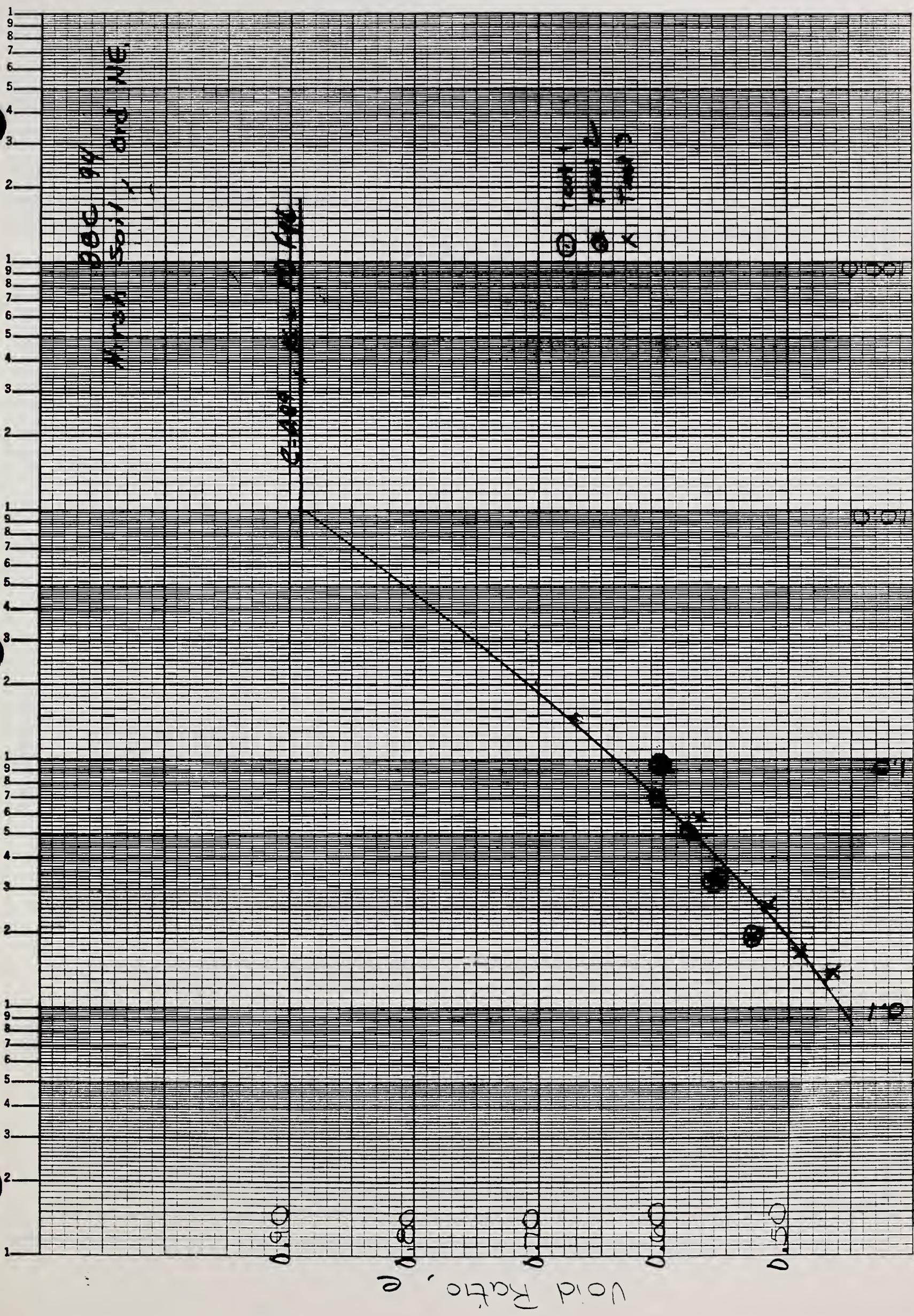
$$C_o = 0.892$$



MATERIALS TESTING REPORT		U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY	
PROJECT AND STATE Wepp Hirsh - Ord, Ne.				SAMPLE LOCATION	
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE Compacted	TESTED AT SML, Lincoln	APPROVED BY			DATE
CLASSIFICATION NON-PLASTIC SM LL PI				SPECIFIC GRAVITY	
TEST NO.	100	500	1000	2000	$G_s (-)^4$
INITIAL MOISTURE %					$G_s (+)^4$
DRY DENSITY <input type="checkbox"/> g/cc <input type="checkbox"/> pcf	1.67	1.74	1.77	1.80	$G_m(\text{Bulk})(+)^4$
VOID RATIO	.5704	.5131	.4881	.4626	TEST SPECIFICATIONS Falling Head Perm
PERMEABILITY COEF F.P.D.	.58296	.26331	.17082	.14340	
PERCOLATION COEF					
H/L DURING TEST					
<p>VOID RATIO (e)</p> <p>PERMEABILITY COEF (k) F.P.D.</p>					
REMARKS $e_0 = 0.892$					



K.E SEMI-LOGARITHMIC 359.91G
KEUFFEL & ESSER CO. MADE IN U.S.A.
5 CYCLES X 70 DIVISIONS



(f_{pd})

↓

Concentration C.C.T



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

WEPP

KEITH ALBION WY.

SAMPLE LOCATION

Keith - Albion, Wy.

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

TESTED AT

APPROVED BY

DATE

Compacted

SML, Lincoln

CLASSIFICATION

CL

LL 32 PI 13

SPECIFIC GRAVITY

TEST NO.

2000 4000 8000

4

 $G_s (-)^4$

2.59

INITIAL MOISTURE %

DRY DENSITY g/cc
pcf

1.57 1.63 1.70

 $G_s (+)^4$ $G_m (\text{Bulk}) (+)^4$

VOID RATIO

.6496 .5911 .5265

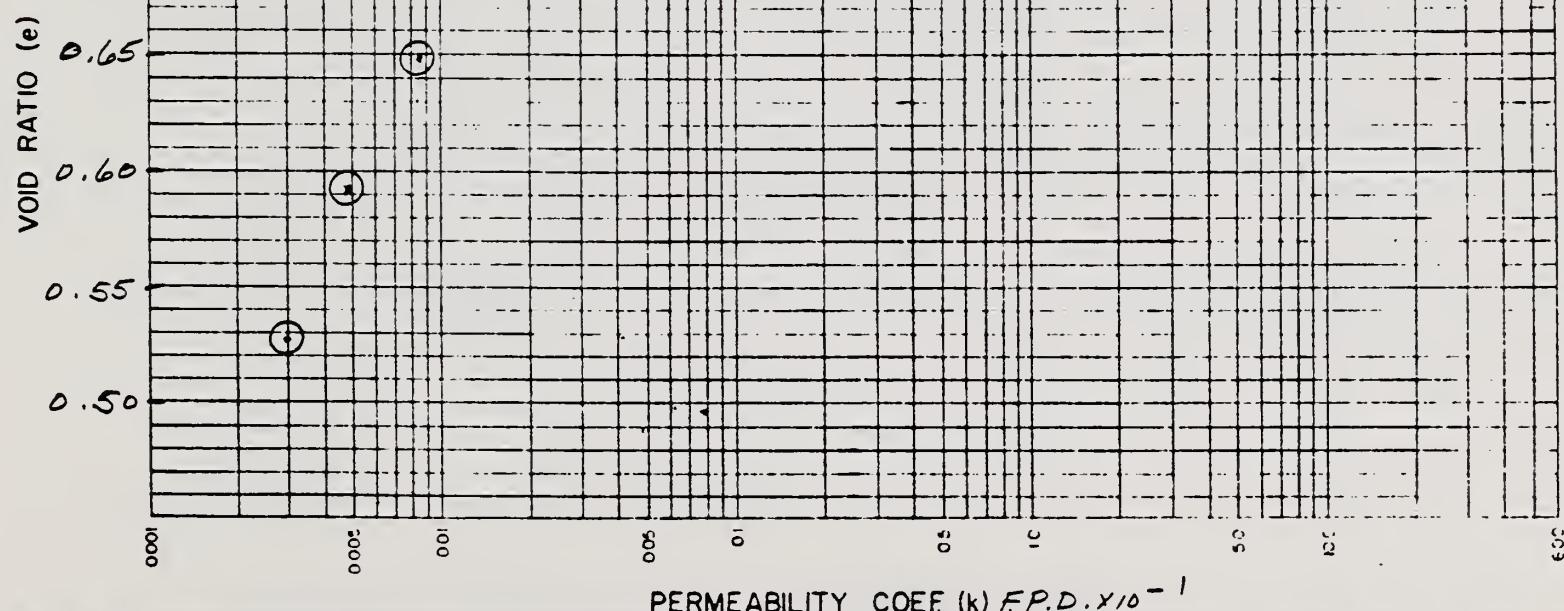
TEST SPECIFICATIONS

PERMEABILITY COEF F.P.D. 1,00085, 0,0049, 0,0030

PERCOLATION COEF

 H_L DURING TEST

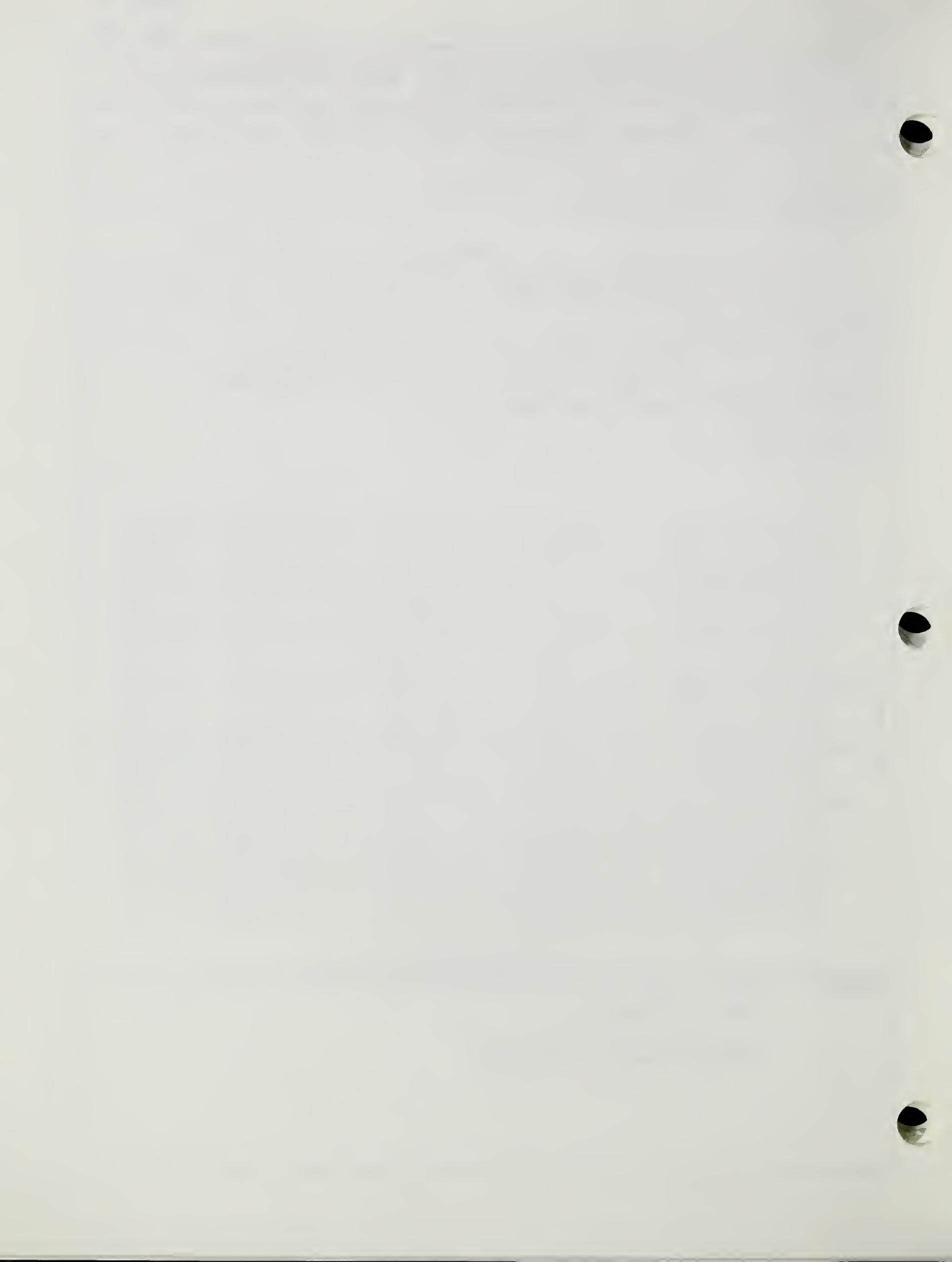
Falling Head Permeability



REMARKS

 $C_0 = 0.962$

Volume Change = 22.2%



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

WePP Keith Albin, Wyo.

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

Compacted

TESTED AT

SML, Lincoln

APPROVED BY

DATE

CLASSIFICATION

CL LL 32 PI 13

SPECIFIC GRAVITY

TEST NO

100

500

1000

2000

 $G_s (-)^{\#} 4$

INITIAL MOISTURE %

 $G_s (+)^{\#} 4$ DRY DENSITY $\square \text{ g/cc}$ $\square \text{pcf}$

1.31

1.41

1.48

1.55

 $G_m (\text{Bulk})(+)^{\#} 4$

VOID RATIO

.9715

.8316

.7475

.6737

PERMEABILITY COEF F.P.D.

.68500

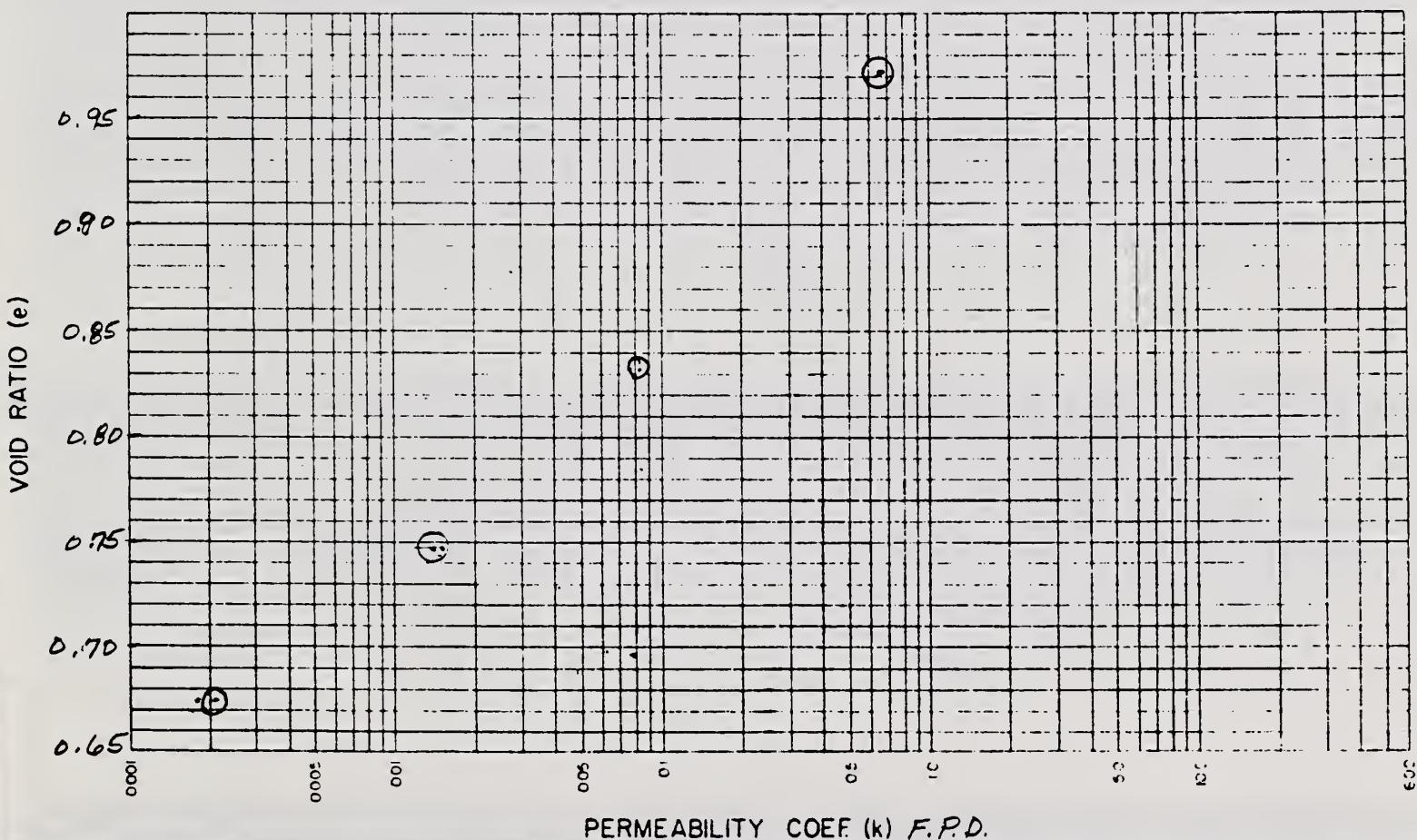
.08395

.01575

.00209

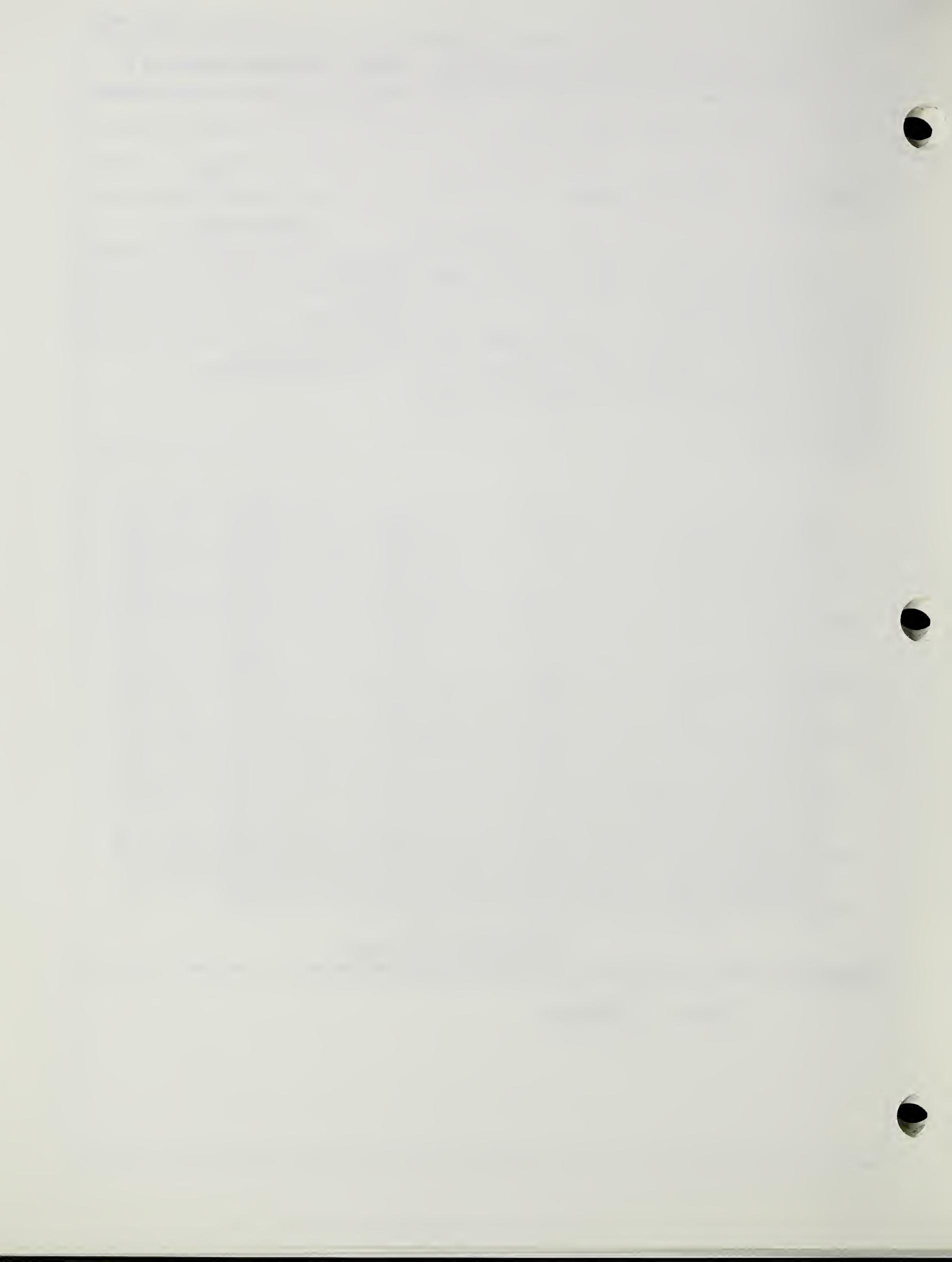
PERCOLATION COEF

H/L DURING TEST

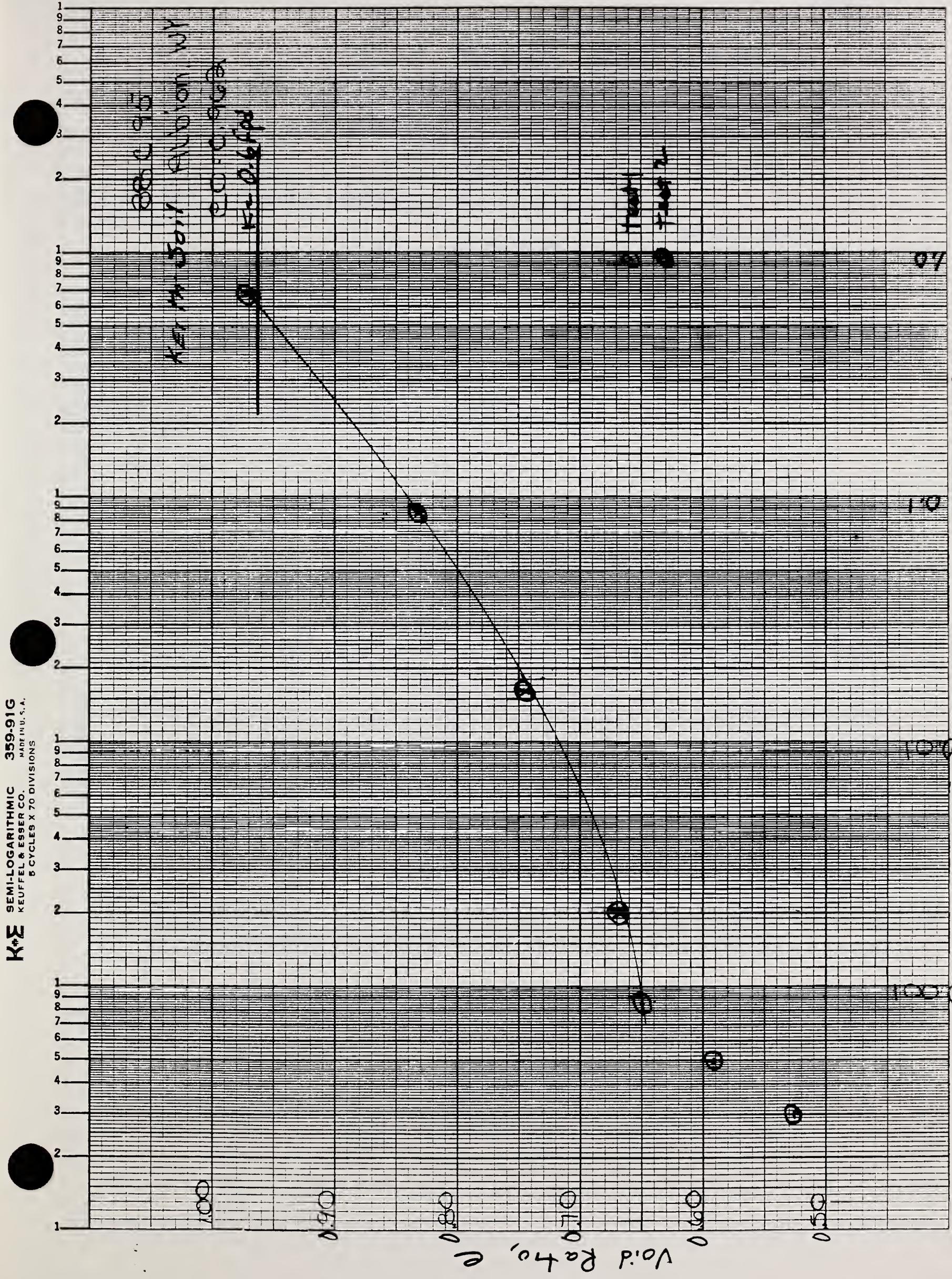
TEST SPECIFICATIONS
Fall, 79 Head Perm.

REMARKS

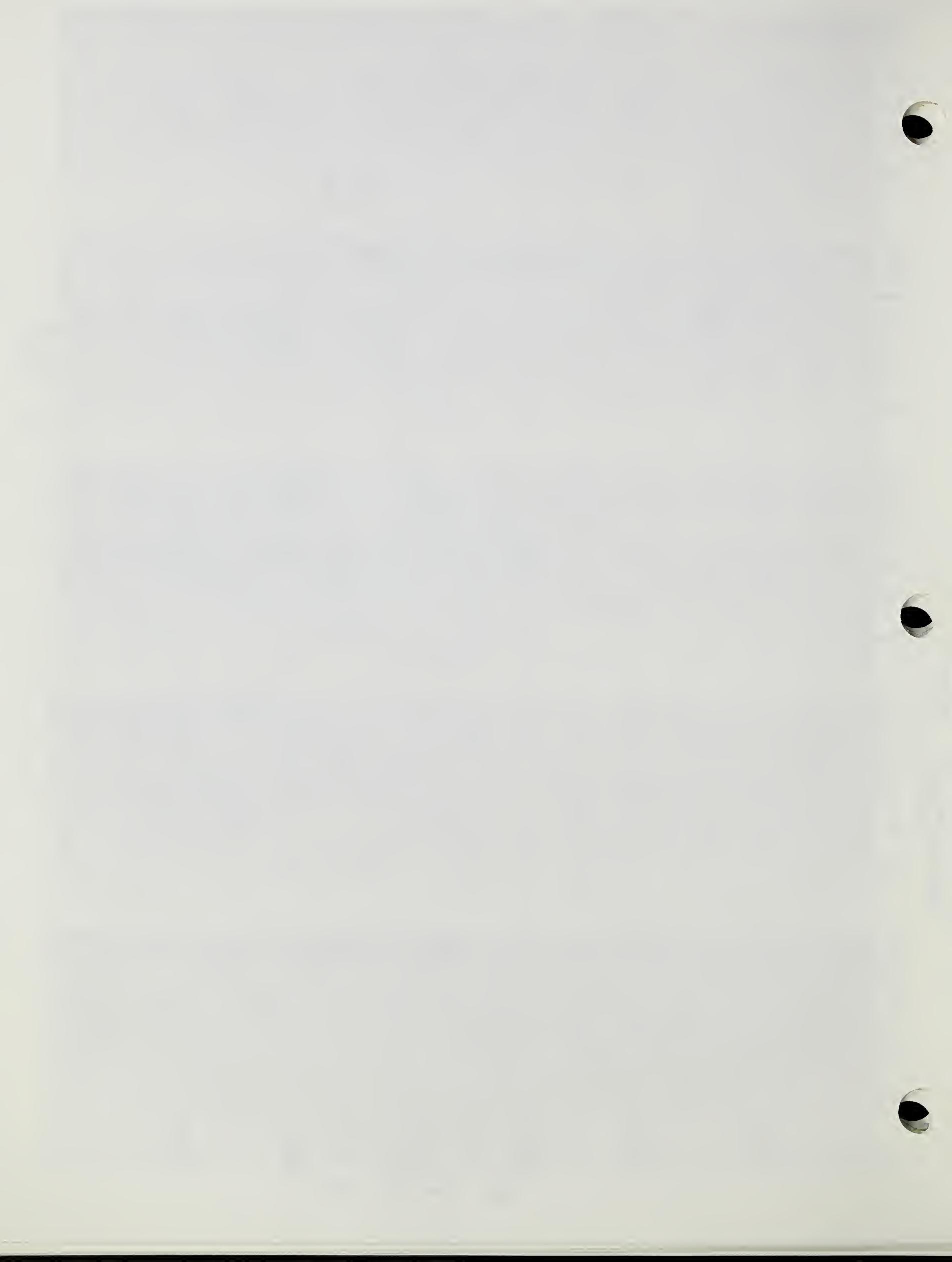
 $e_0 = 0.962$



K-E SEMI-LOGARITHMIC
KEUFFEL & ESSER CO.
MADE IN U.S.A.
5 CYCLES X 70 DIVISIONS



Translating void ratio (e) into liquid limit (LL), κ (fwd)



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

We PP - LOS BANOS - FRESNO, CA.

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

TESTED AT

APPROVED BY

DATE

Compacted

SML, Lincoln

CLASSIFICATION

CL LL 46 PI 25

SPECIFIC GRAVITY

TEST NO

2000

4000

8000

4

 $G_s (-)^* 4$

2.61

INITIAL MOISTURE %

 $G_s (+)^* 4$ DRY DENSITY $\square \text{ g/cc}$
 $\square \text{pcf}$

1.44

1.54

1.64

 $G_m (\text{Bulk})(+)^* 4$

VOID RATIO

.8133

.7003

.5922

TEST SPECIFICATIONS

PERMEABILITY COEF F.P.D.

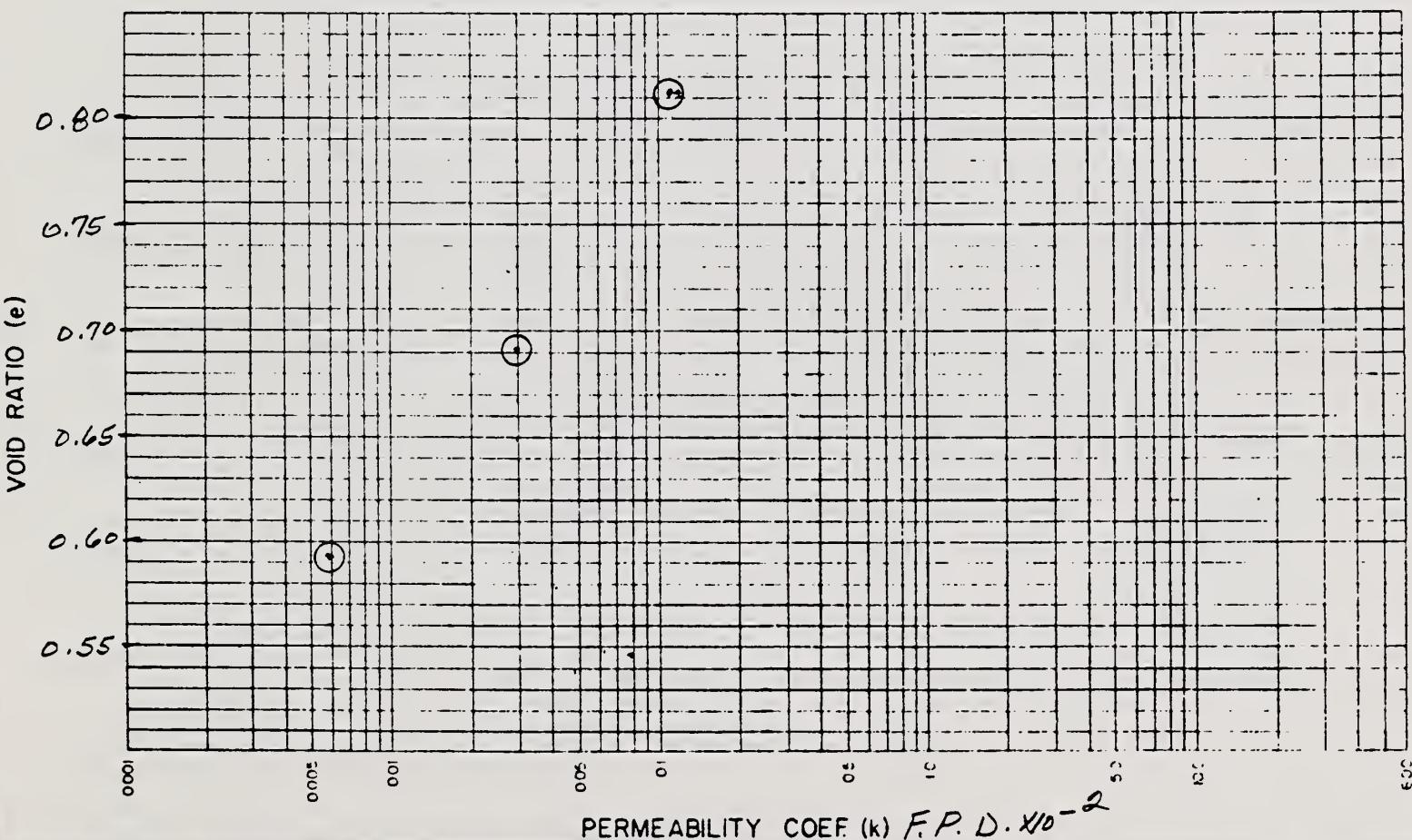
.00122

.00030

.00006

Falling Head Perm

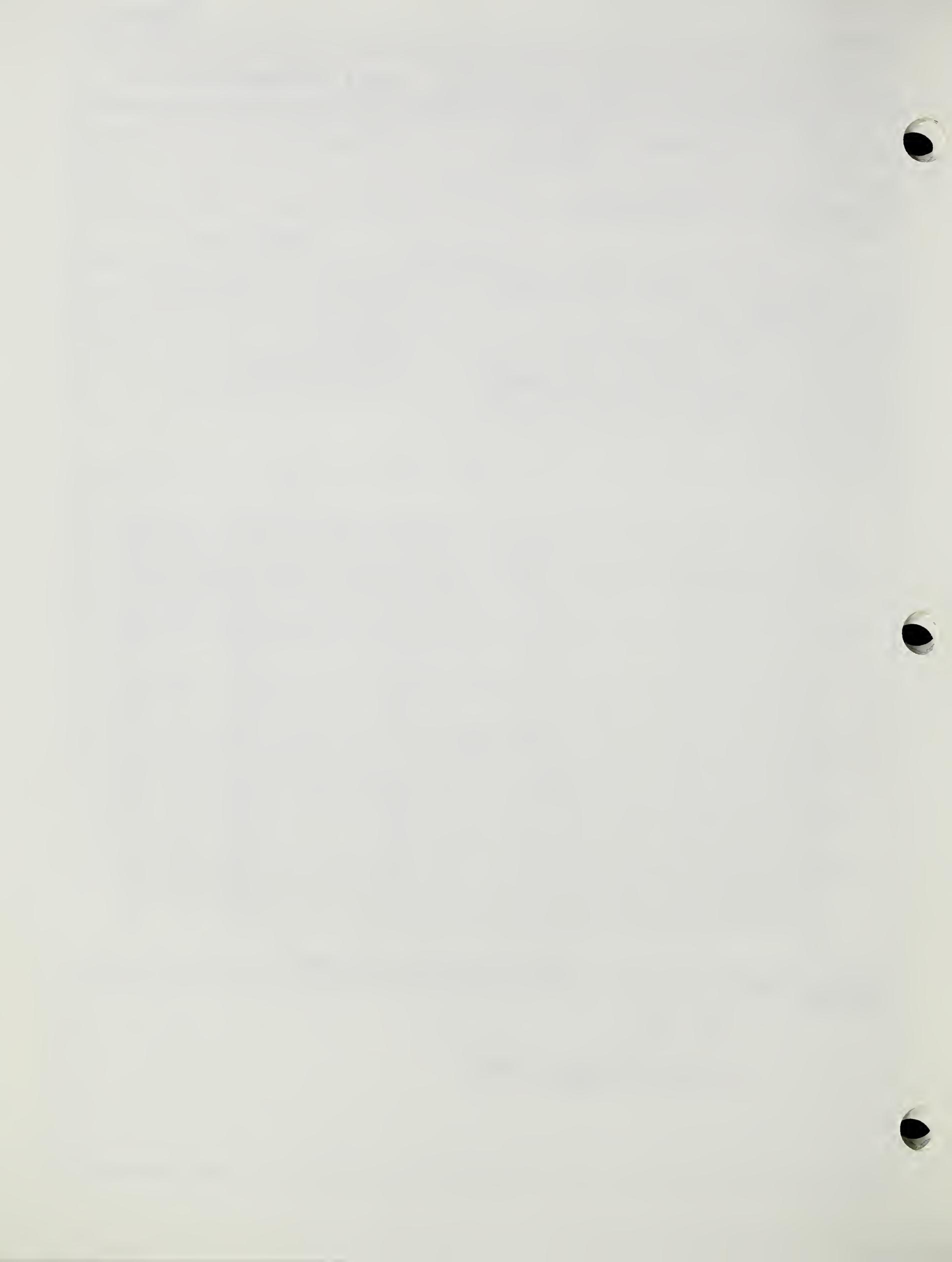
PERCOLATION COEF

 H_L DURING TEST

REMARKS

 $e_0 = 1.61$

Volume Change = 39%



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

WePP - Los Banos - Fresno, CA.

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

TESTED AT

APPROVED BY

DATE

CLASSIFICATION

CL

LL 46 PI 25

SPECIFIC GRAVITY

TEST NO.

100

500

1000

2000

 $G_s (-)^4$

2.61

INITIAL MOISTURE %

DRY DENSITY

 g/ccpcf

1.10

1.30

1.38

1.46

 $G_s (+)^4$ $G_m (\text{Bulk}) (+)^4$

VOID RATIO

1.3613

1.0145

.8860

.7822

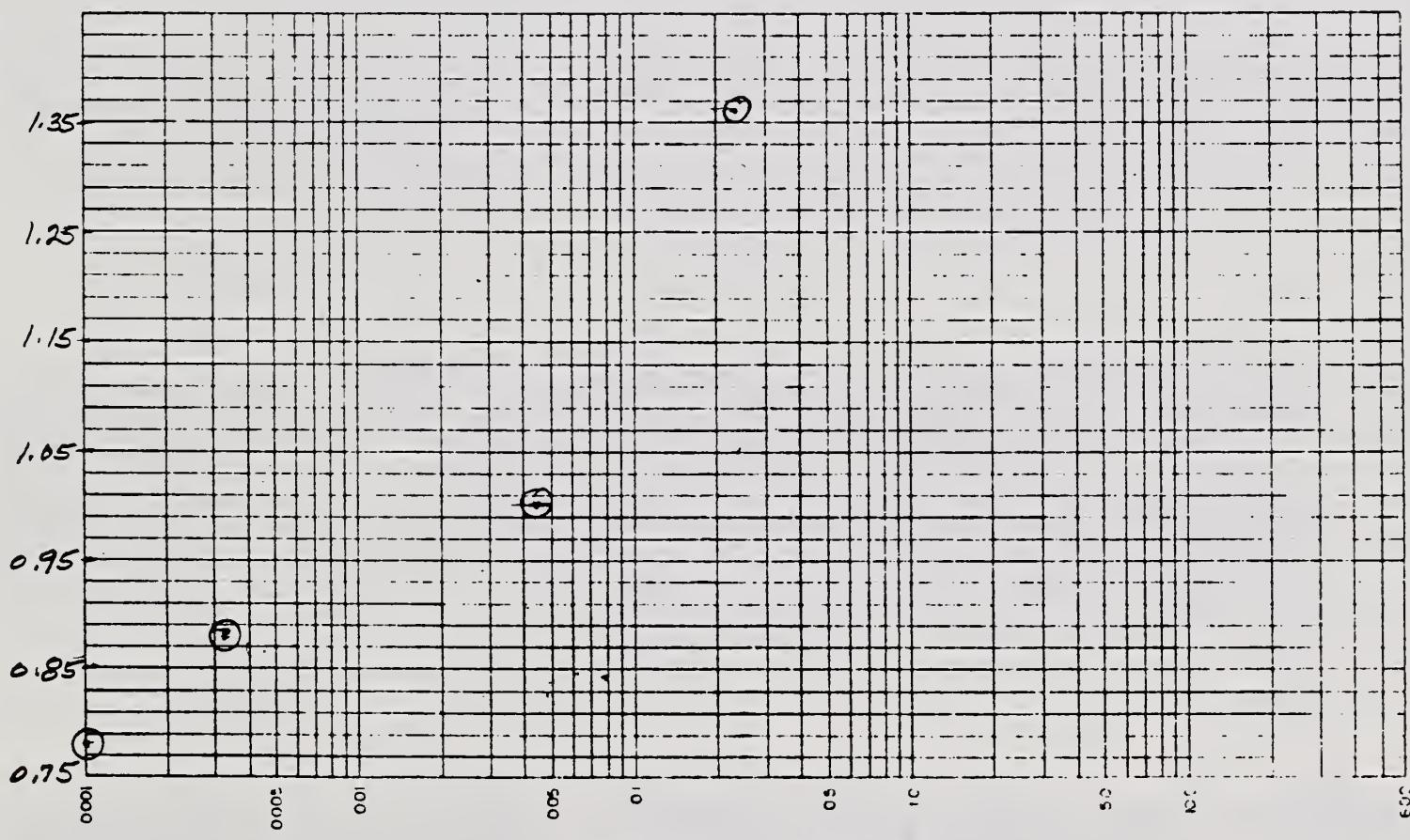
TEST SPECIFICATIONS

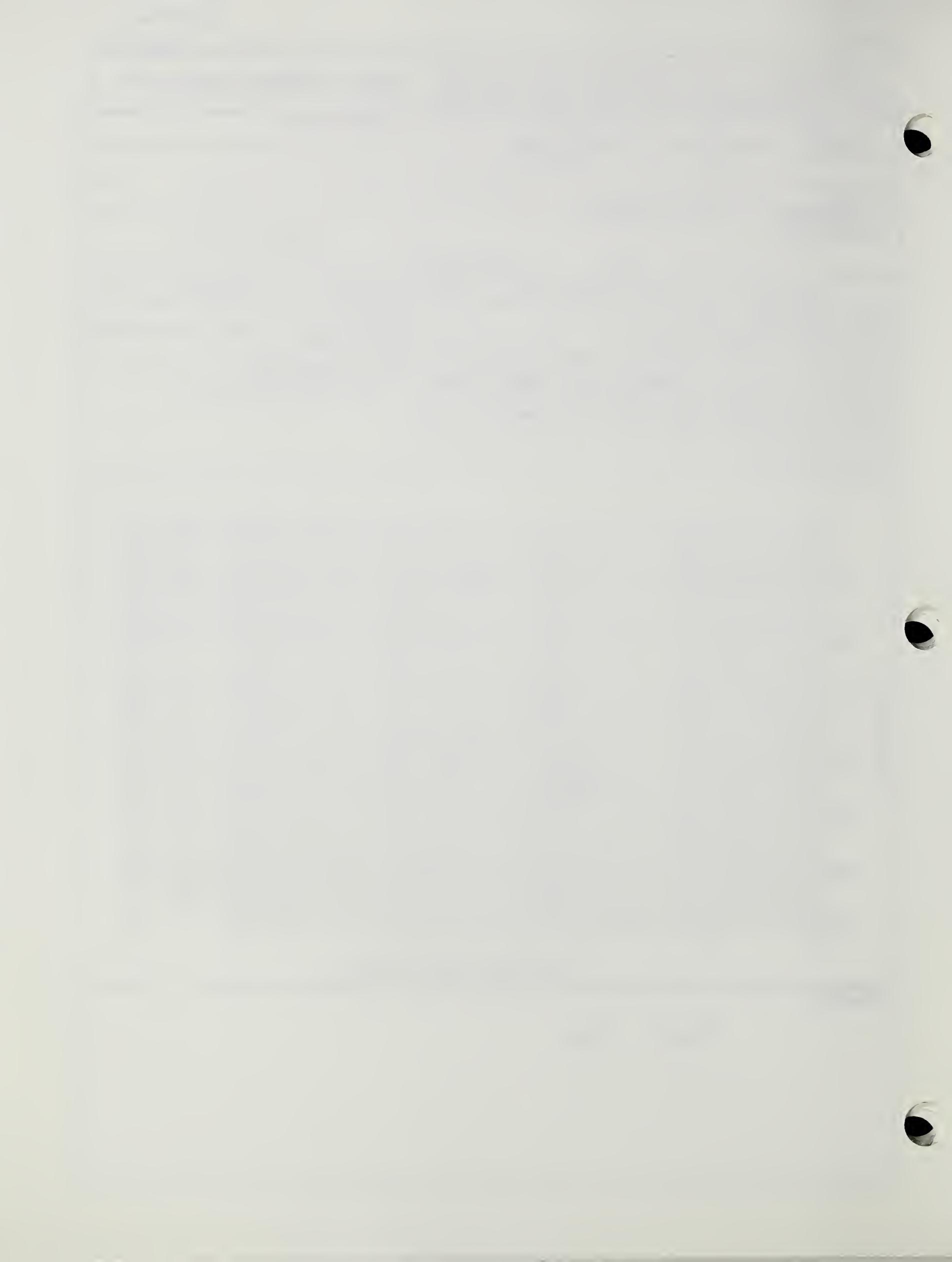
Falling Head Permeability

PERCOLATION COEF

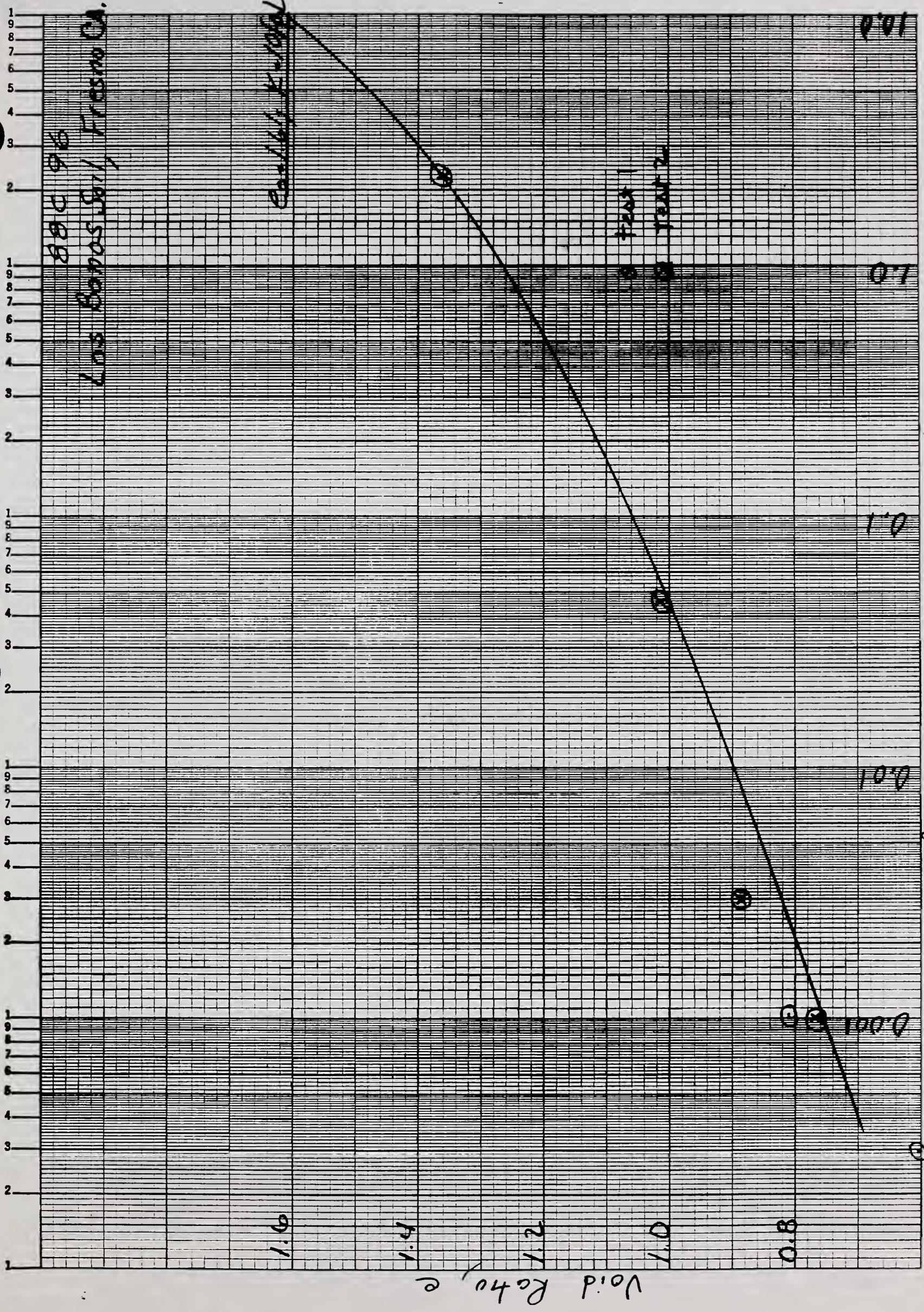
H/L DURING TEST

VOID RATIO (e)





K_oE SEMI-LOGARITHMIC 358-91
KEUFFEL & ESSER CO. MADE IN U.S.A.
5 CYCLES X 70 DIVISIONS

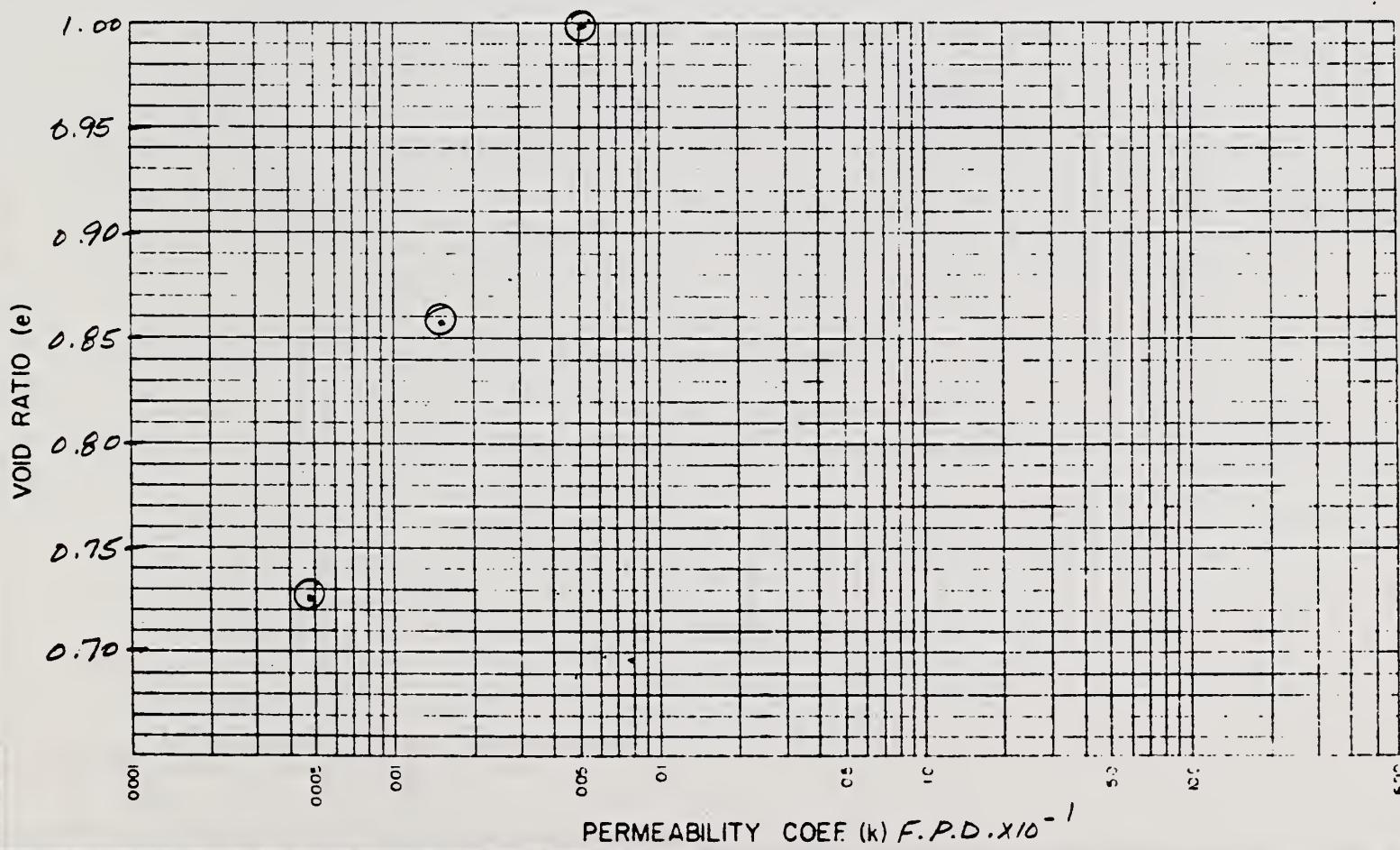


Permeability Coef., K (cm^3/sec)



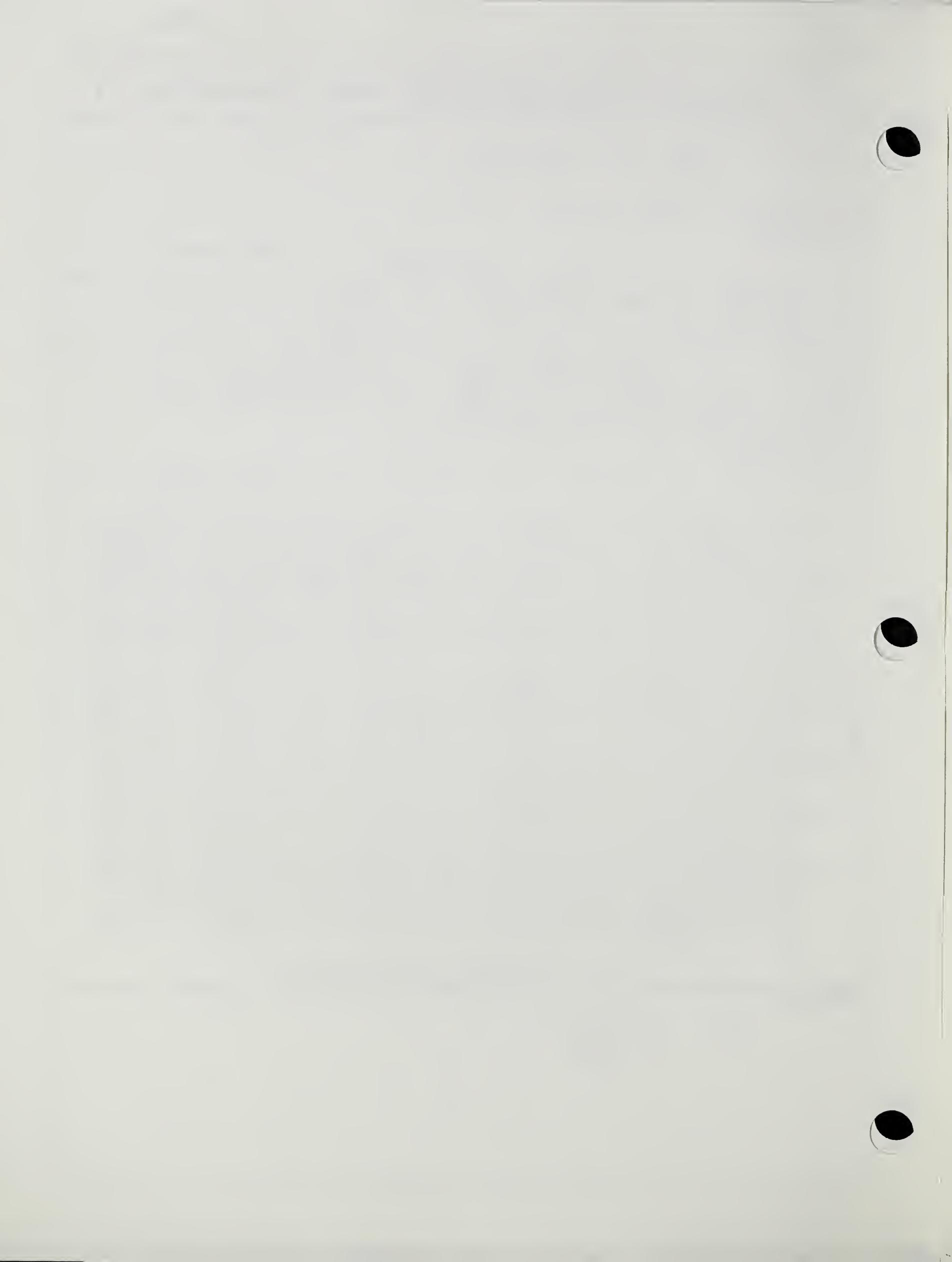
MATERIALS TESTING REPORT	U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE	SOIL PERMEABILITY
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PROJECT AND STATE WEP - Pierre - Cottonwood, S.D.			SAMPLE LOCATION			
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN				
TYPE OF SAMPLE Compacted	TESTED AT SML, Lincoln	APPROVED BY	DATE			
CLASSIFICATION						
	CH	LL 52 PI 32	SPECIFIC GRAVITY			
TEST NO.	2000	4000	8000	4	$G_s (-)^{\#4}$	2.71
INITIAL MOISTURE %					$G_s (+)^{\#4}$	
DRY DENSITY $\frac{g}{cc}$	1.36	1.46	1.57		$G_m (\text{Bulk}) (+)^{\#4}$	
VOID RATIO	.9999	.8577	.7258		TEST SPECIFICATIONS Falling Head Perz.	
PERMEABILITY COEF F.P.D.	.00518	.00160	.00049			
PERCOLATION COEF						
H/L DURING TEST						

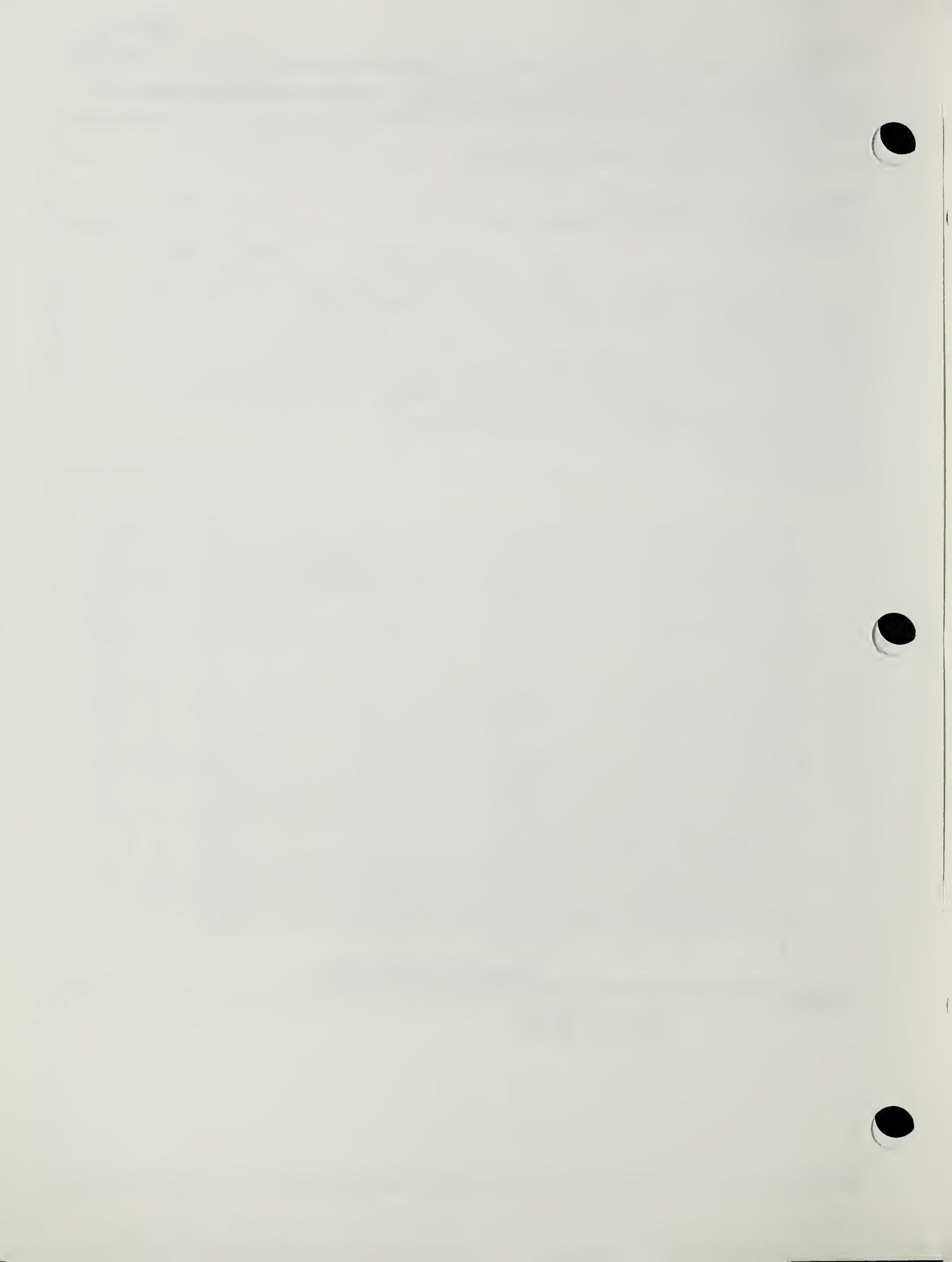


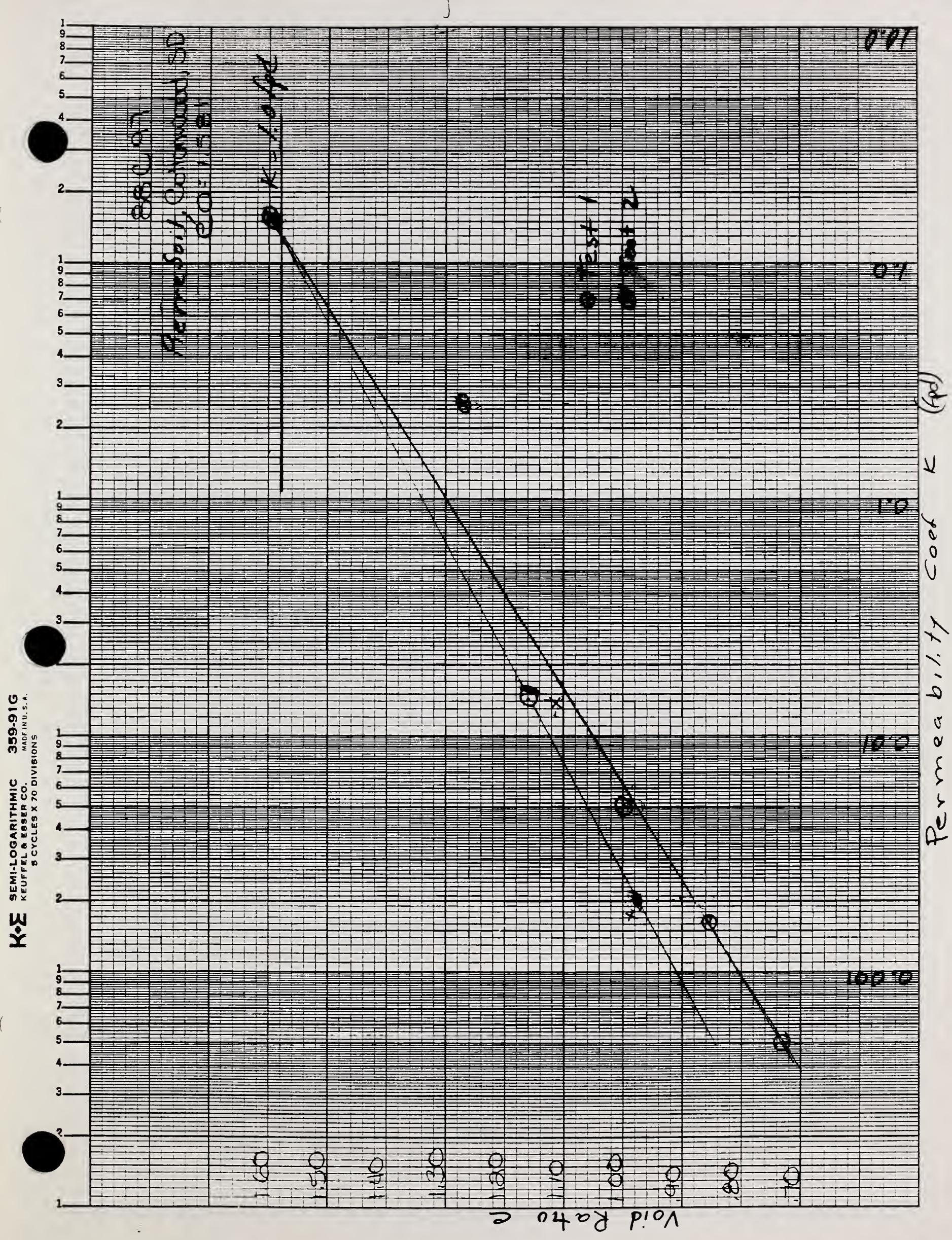
REMARKS

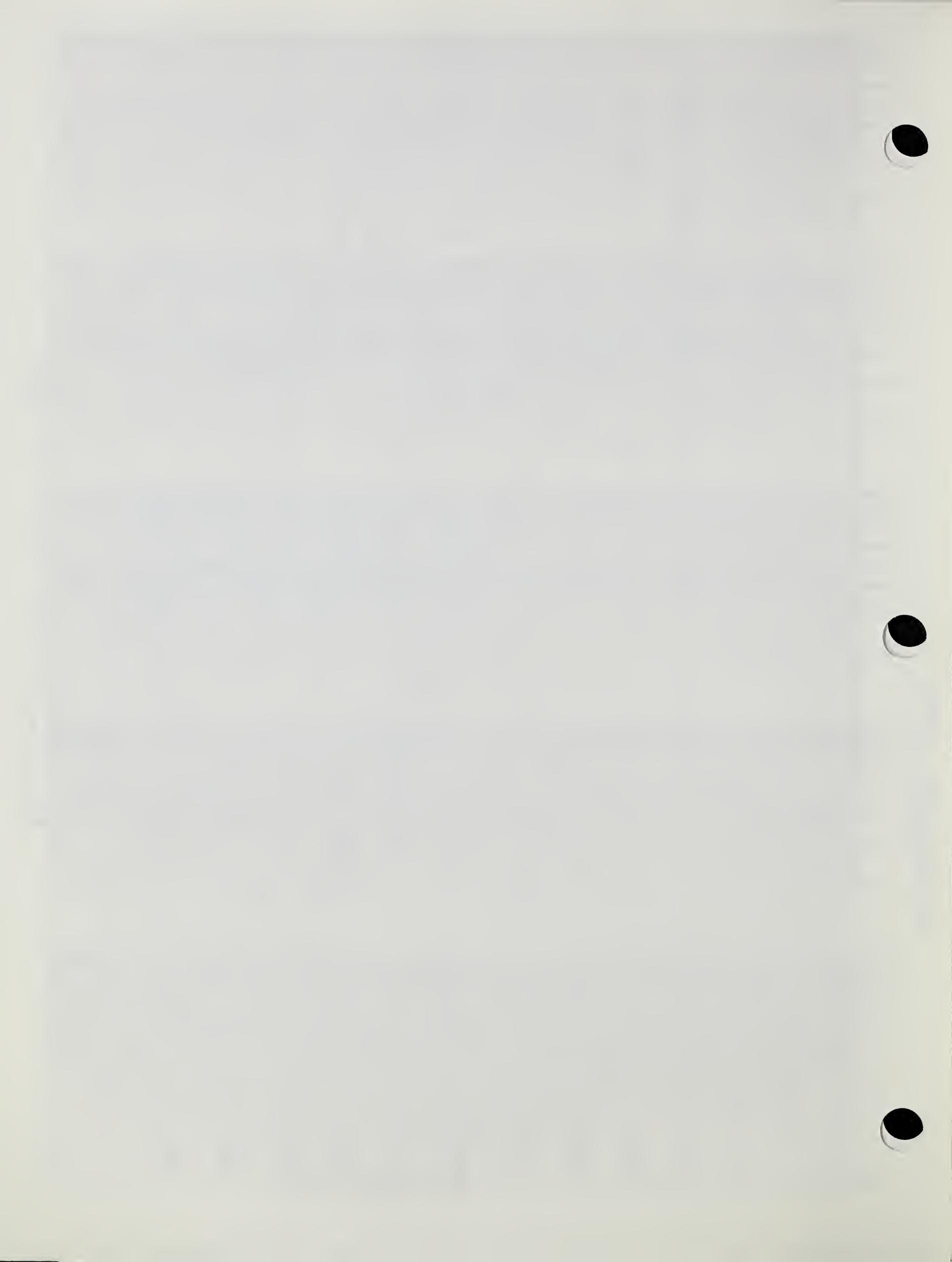
$$e_0 = 1.581$$



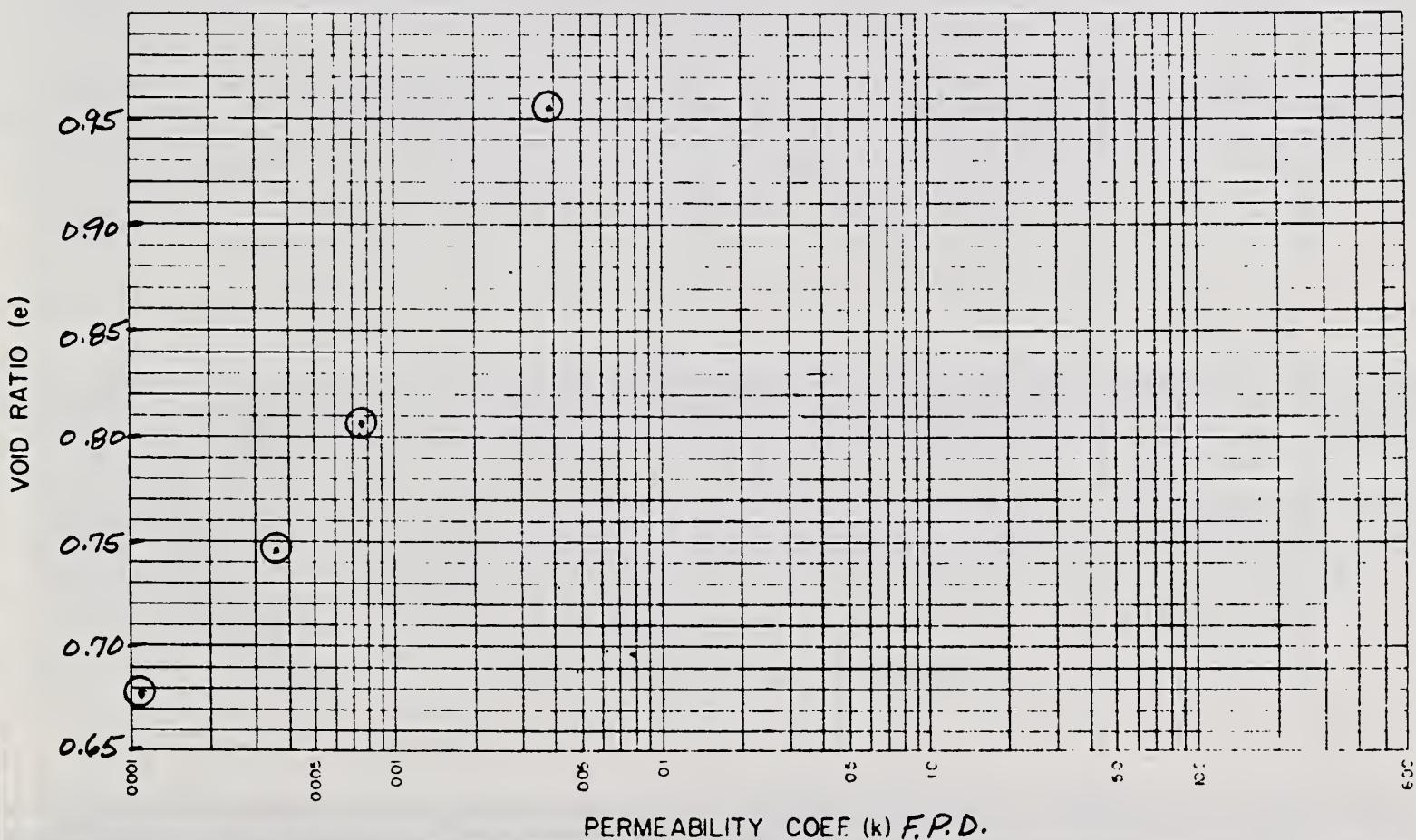
MATERIALS TESTING REPORT		U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY		
PROJECT and STATE <i>WePP - Pierre - Cottonwood SD.</i>		SAMPLE LOCATION				
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN				
TYPE OF SAMPLE <i>Compacted</i>	TESTED AT <i>SML, Lincoln</i>	APPROVED BY			DATE	
CLASSIFICATION <i>CH LL 52 PI 32</i>		SPECIFIC GRAVITY				
TEST NO	10 ¹	5 ² 00	10 ³ 00	20 ⁴ 00	$G_s (-)^{\#4}$	2.71
INITIAL MOISTURE %					$G_s (+)^{\#4}$	
DRY DENSITY <input type="checkbox"/> g/cc <input type="checkbox"/> pcf	1.04	1.19	1.28	1.37	$G_m(\text{Bulk}) (+)^{\#4}$	
VOID RATIO	1.5976	1.2719	1.1168	.9836	TEST SPECIFICATIONS <i>Falling Head Perm.</i>	
PERMEABILITY COEF F.P.D.	1.5267	.25252	.01389	.00175		
PERCOLATION COEF						
H/L DURING TEST						
<p>Y-axis: VOID RATIO (e) X-axis: PERMEABILITY COEF. (k) F.P.D.</p>						
REMARKS $e_0 = 1.581$						



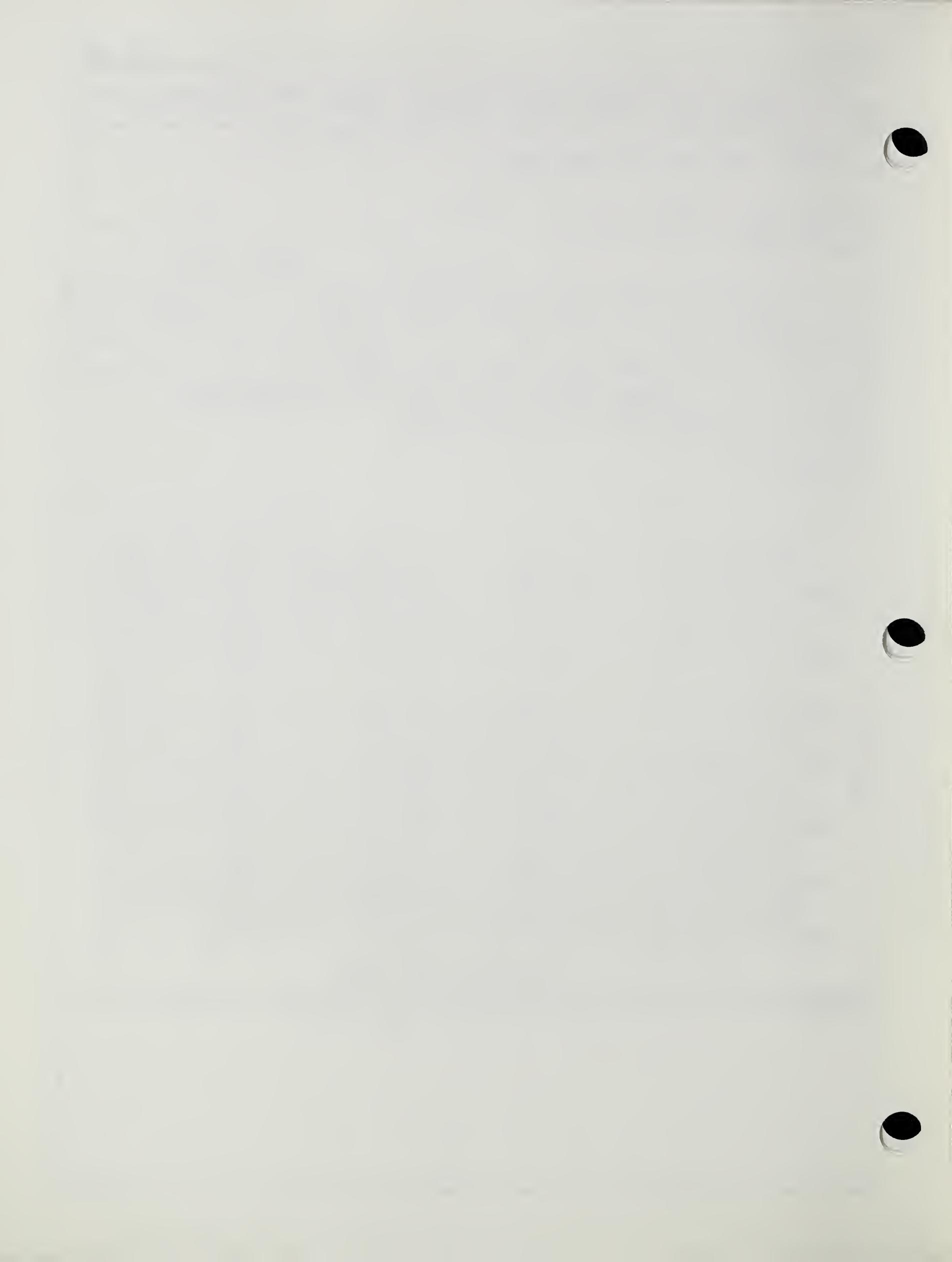




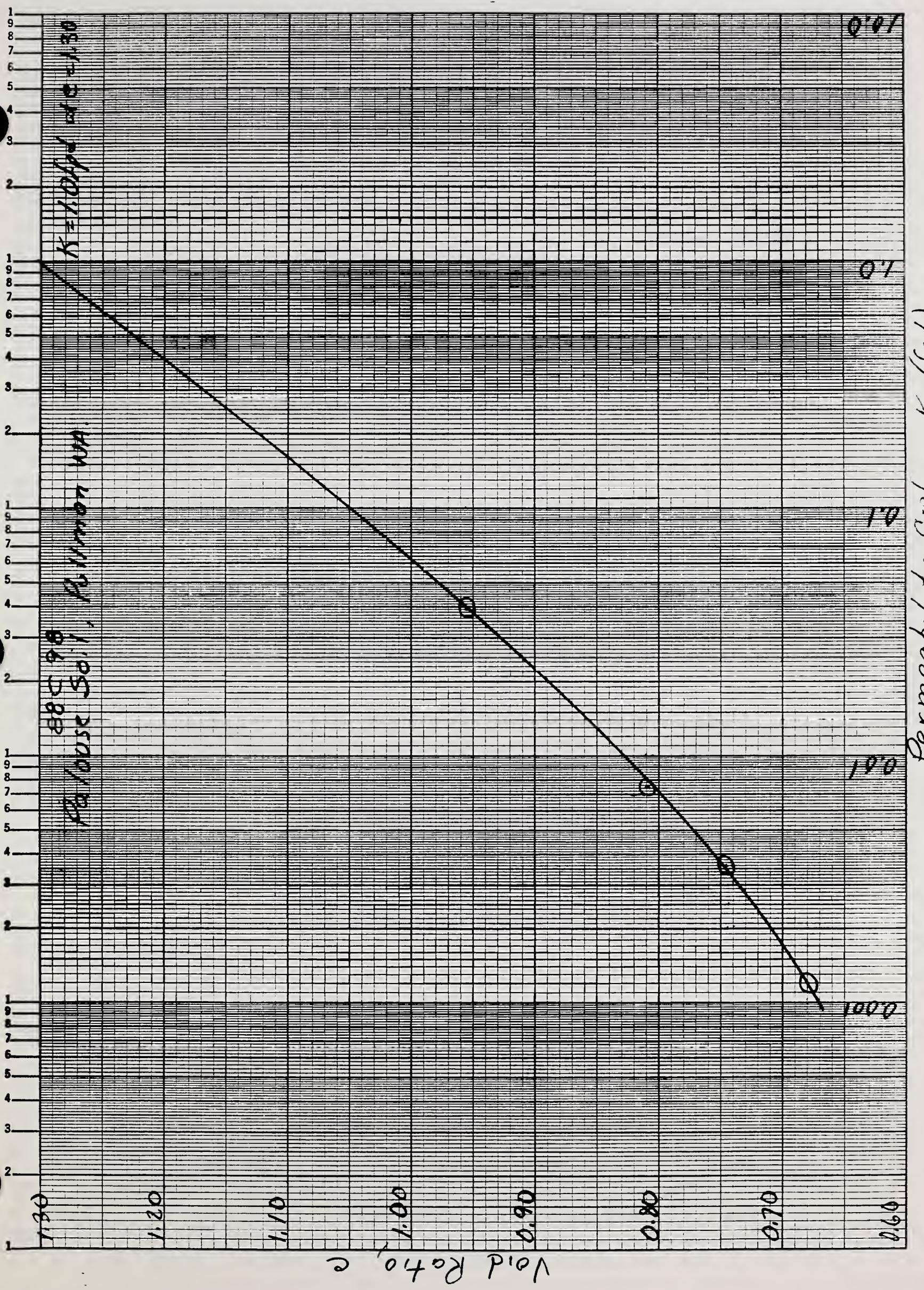
MATERIALS TESTING REPORT		U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY	
PROJECT AND STATE <u>WePP - Palouse - Pullman, Wa.</u>				SAMPLE LOCATION	
FIELD SAMPLE NO.	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE <u>Compacted</u>	TESTED AT <u>SML, Lincoln</u>	APPROVED BY		DATE	
CLASSIFICATION <u>CL LL 31 PI 13</u>				SPECIFIC GRAVITY	
TEST NO.	100	580	1000	2000	$G_s (-)^{\#4}$
INITIAL MOISTURE %					$G_s (+)^{\#4}$
DRY DENSITY □ g/cc □pcf	1.35	1.46	1.51	1.57	$G_m (\text{Bulk}) (+)^{\#4}$
VOID RATIO	.9552	.8083	.7459	.6797	TEST SPECIFICATIONS <u>Falling Head Perm.</u>
PERMEABILITY COEF. F.P.D.	.03979	.00753	.00364	.00118	
PERCOLATION COEF					
H/L DURING TEST					

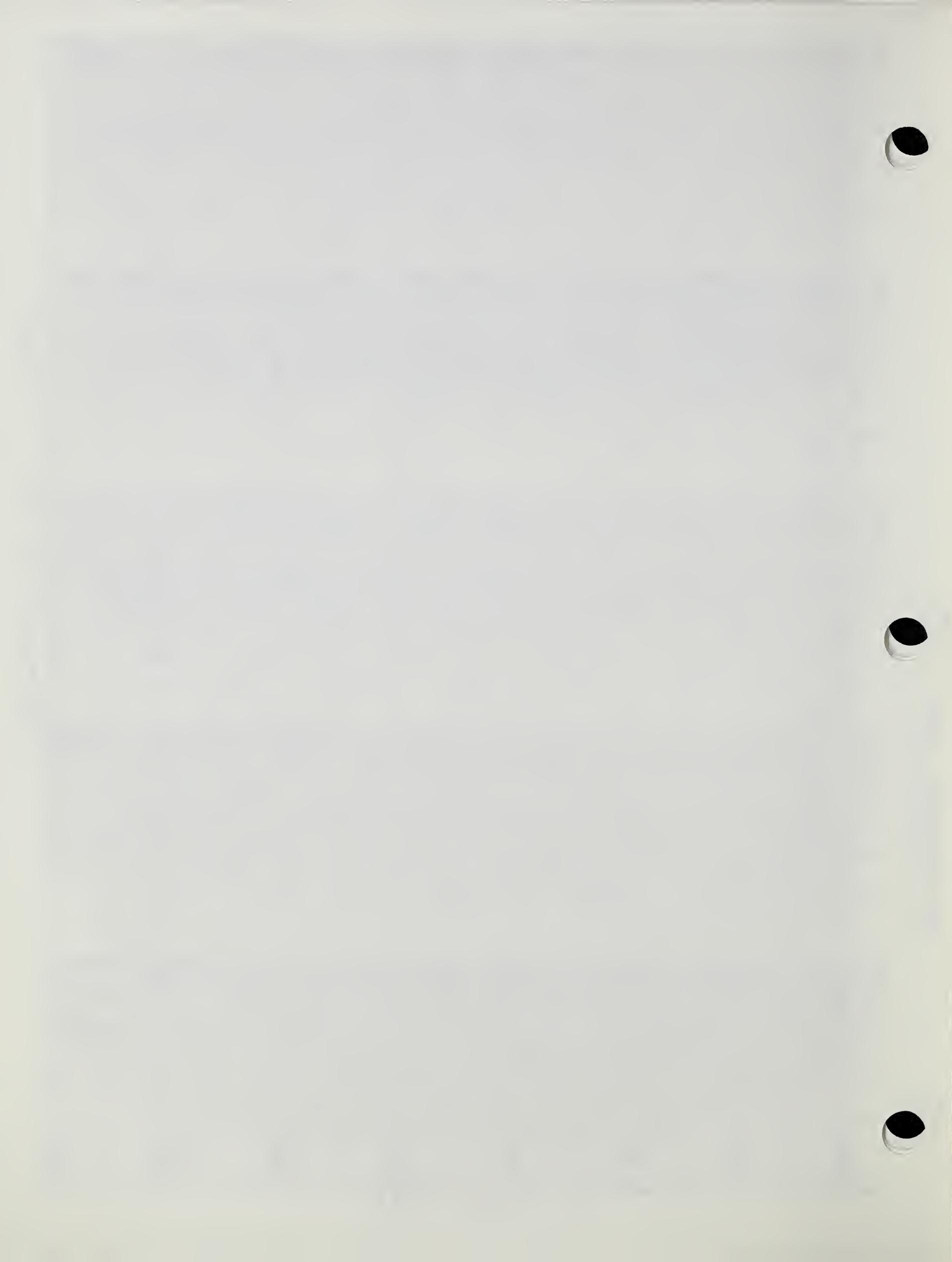


REMARKS



Permeability, Cost K (Spd)





MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

WEPP

PORTNEUF

KIMBERLY ID.

SAMPLE LOCATION

Portneuf-Kimberly, ID.

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

TESTED AT

APPROVED BY

DATE

Compacted

SML, Lincoln

CLASSIFICATION

CL-ML LL 28 PI 4

SPECIFIC GRAVITY

TEST NO.

2000

4000

8000

4

 $G_s (-)^{\#4}$

2.66

INITIAL MOISTURE %

 $G_s (+)^{\#4}$ DRY DENSITY g/ccpcf

1.40

1.46

1.53

 $G_m (\text{Bulk}) (+)^{\#4}$

VOID RATIO

.8939

.8167

.7386

TEST SPECIFICATIONS
FALLING HEAD PERM.

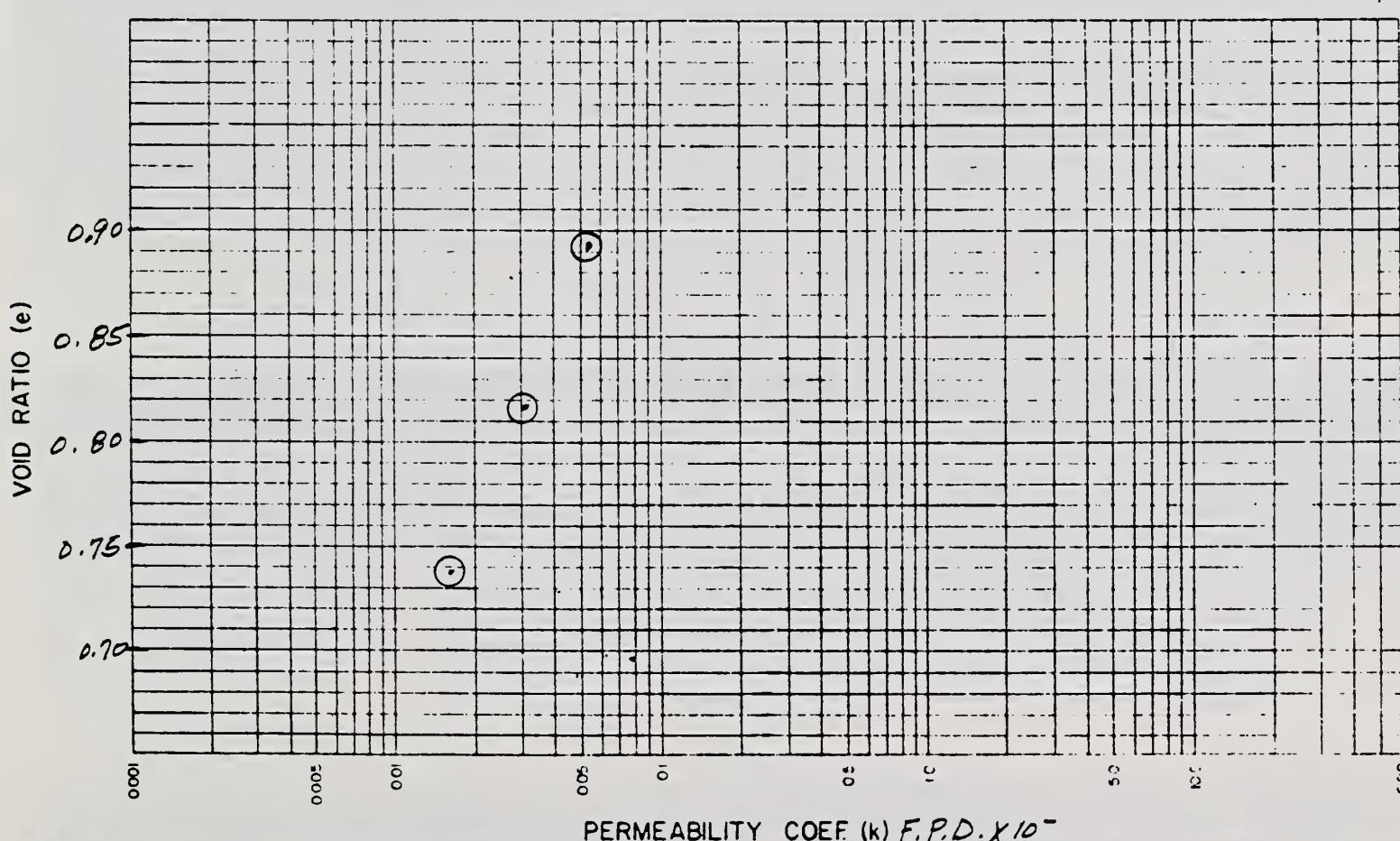
PERMEABILITY COEF F.P.D.

.05286

.03103

.01742

PERCOLATION COEF

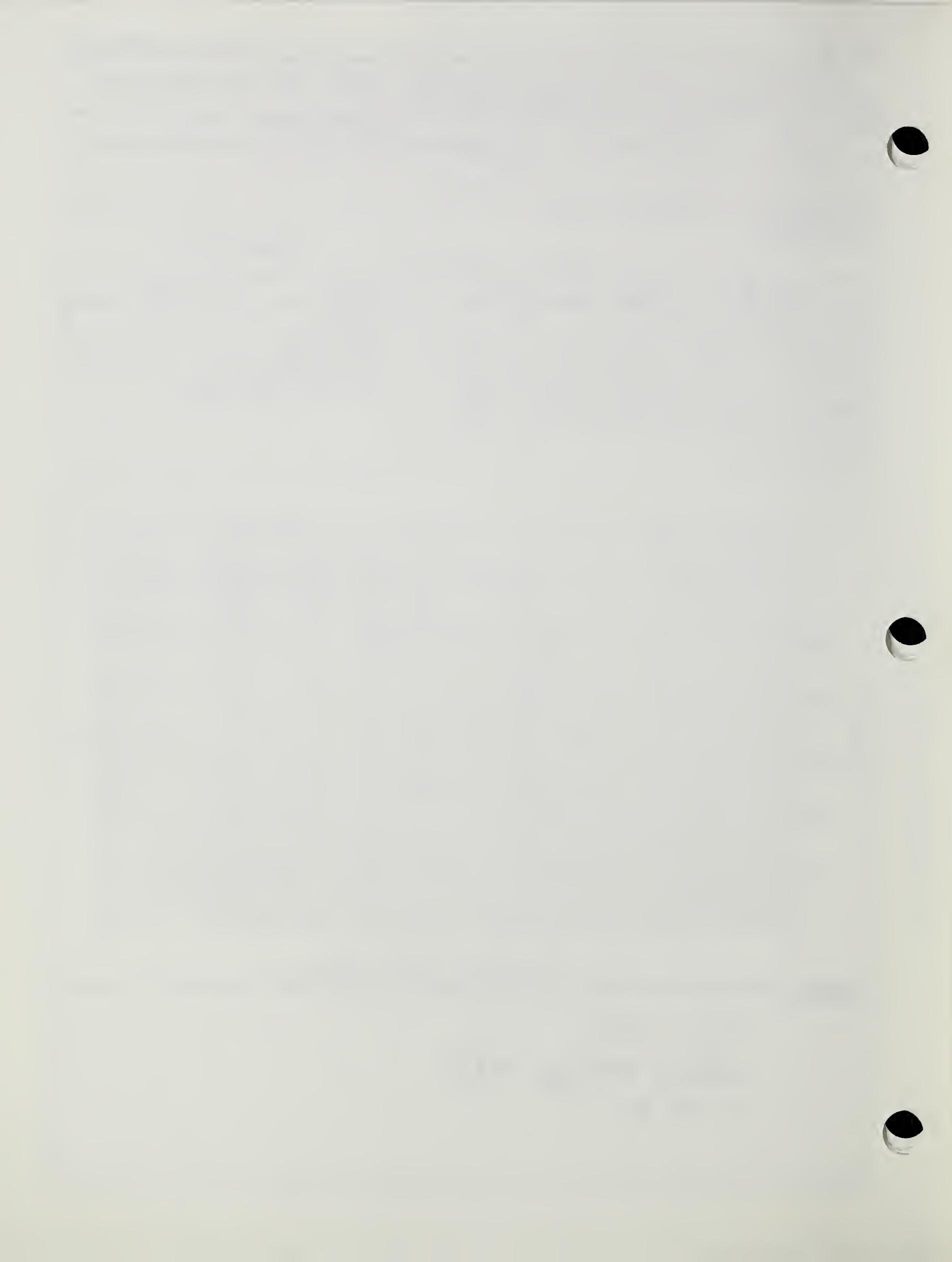
 H_L DURING TEST

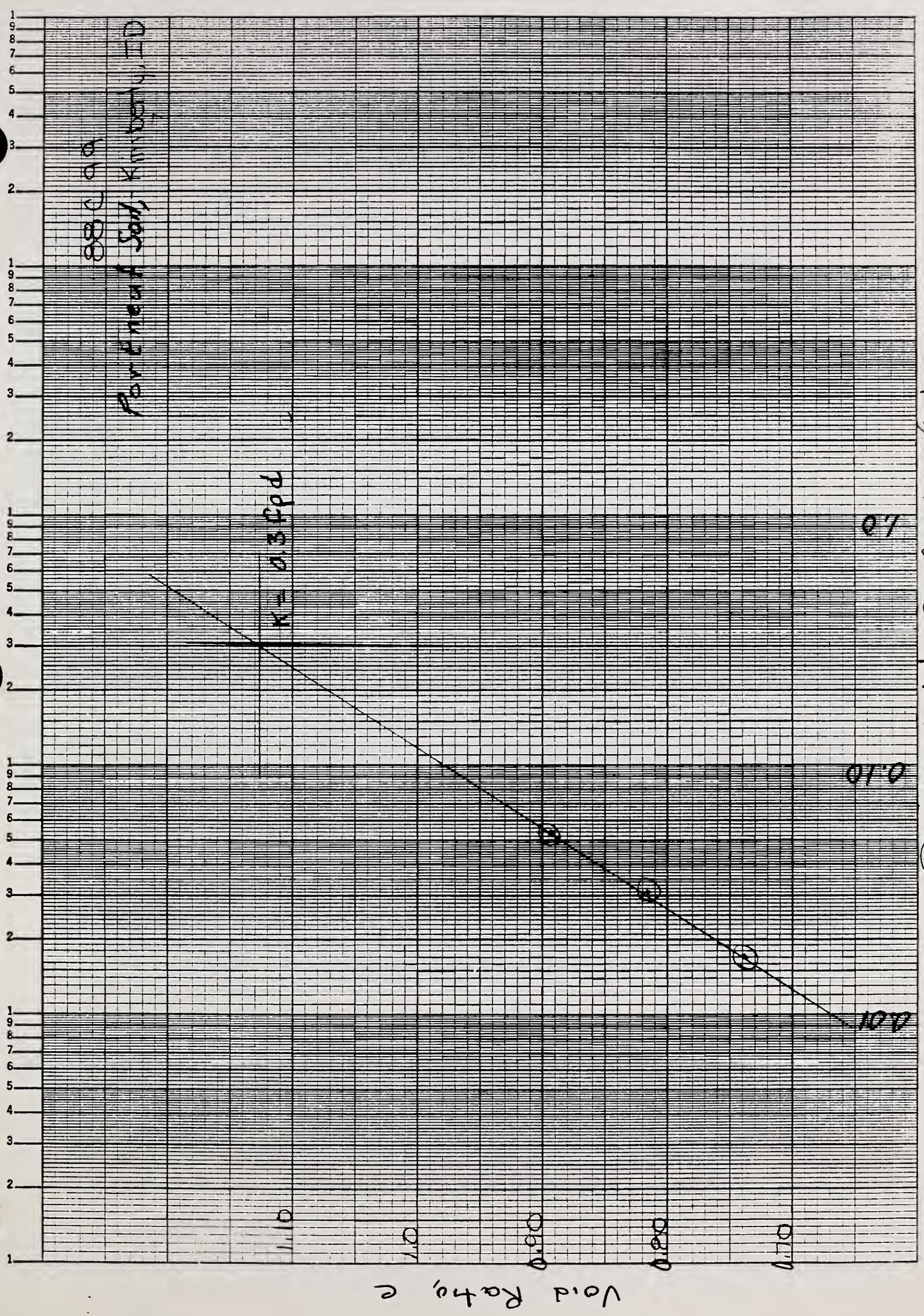
REMARKS

 $e_0 = 1.127$

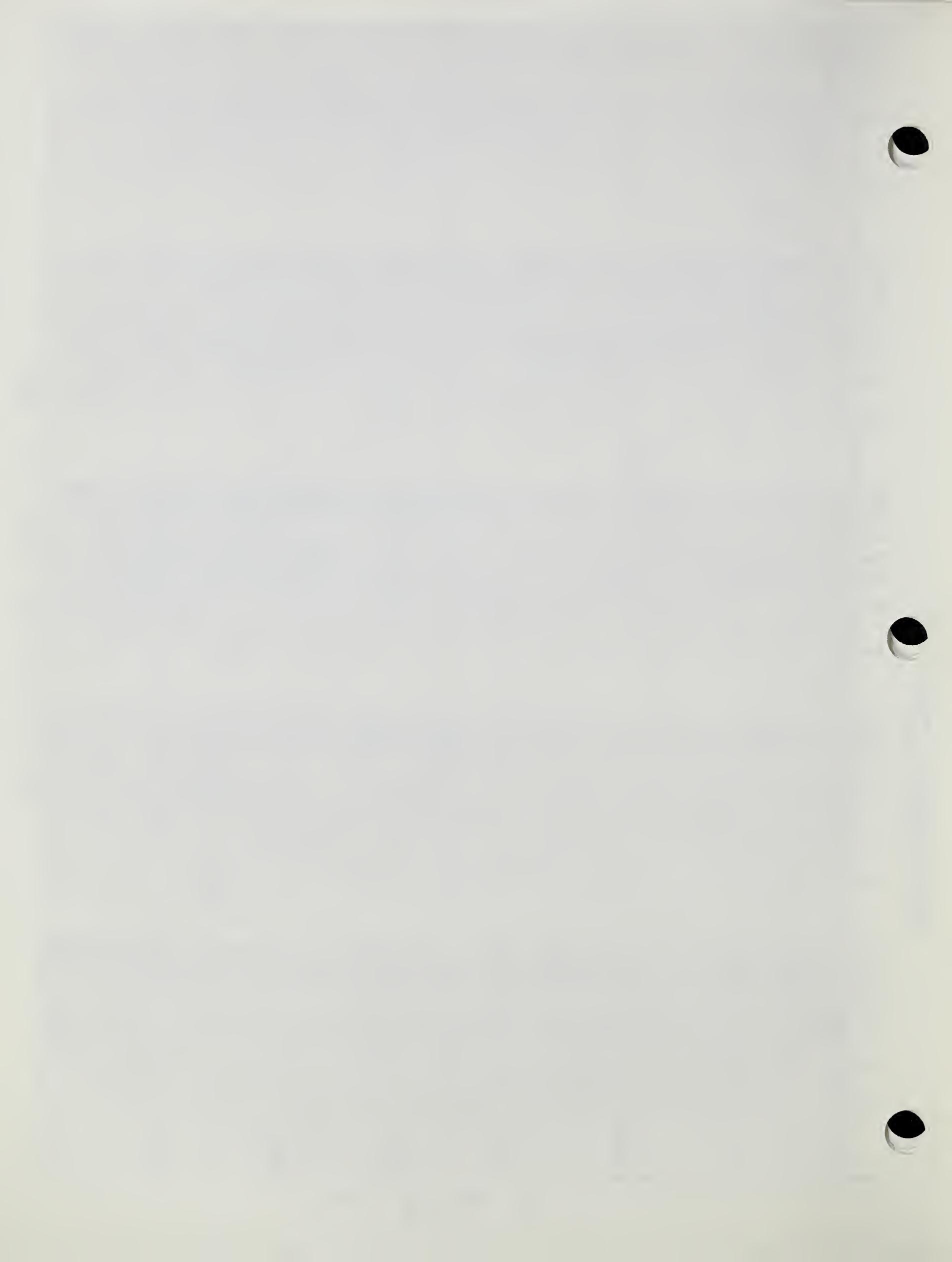
Volume Change - 18.3%

 K at $e_0 =$





Permeability Coeff., K (ft/d)



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

We PP - Sharpsburg, Lincoln, Ne

SAMPLE LOCATION

FIELD SAMPLE NO.

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

Compacted

TESTED AT

SML, Lincoln

APPROVED BY

DATE

CLASSIFICATION

CL

LL 49 PI 30

SPECIFIC GRAVITY

TEST NO.

2000

4800

8800

4

 $G_s (-)^* 4$

2.63

INITIAL MOISTURE %

 $G_s (+)^* 4$ DRY DENSITY $\frac{\text{g/cc}}{\text{pcf}}$

1.39

1.46

1.55

 $G_m(\text{Bulk})(+)^* 4$

VOID RATIO

.8945

.7976

.6922

PERMEABILITY COEFF. F.P.D.

.00116

.00032

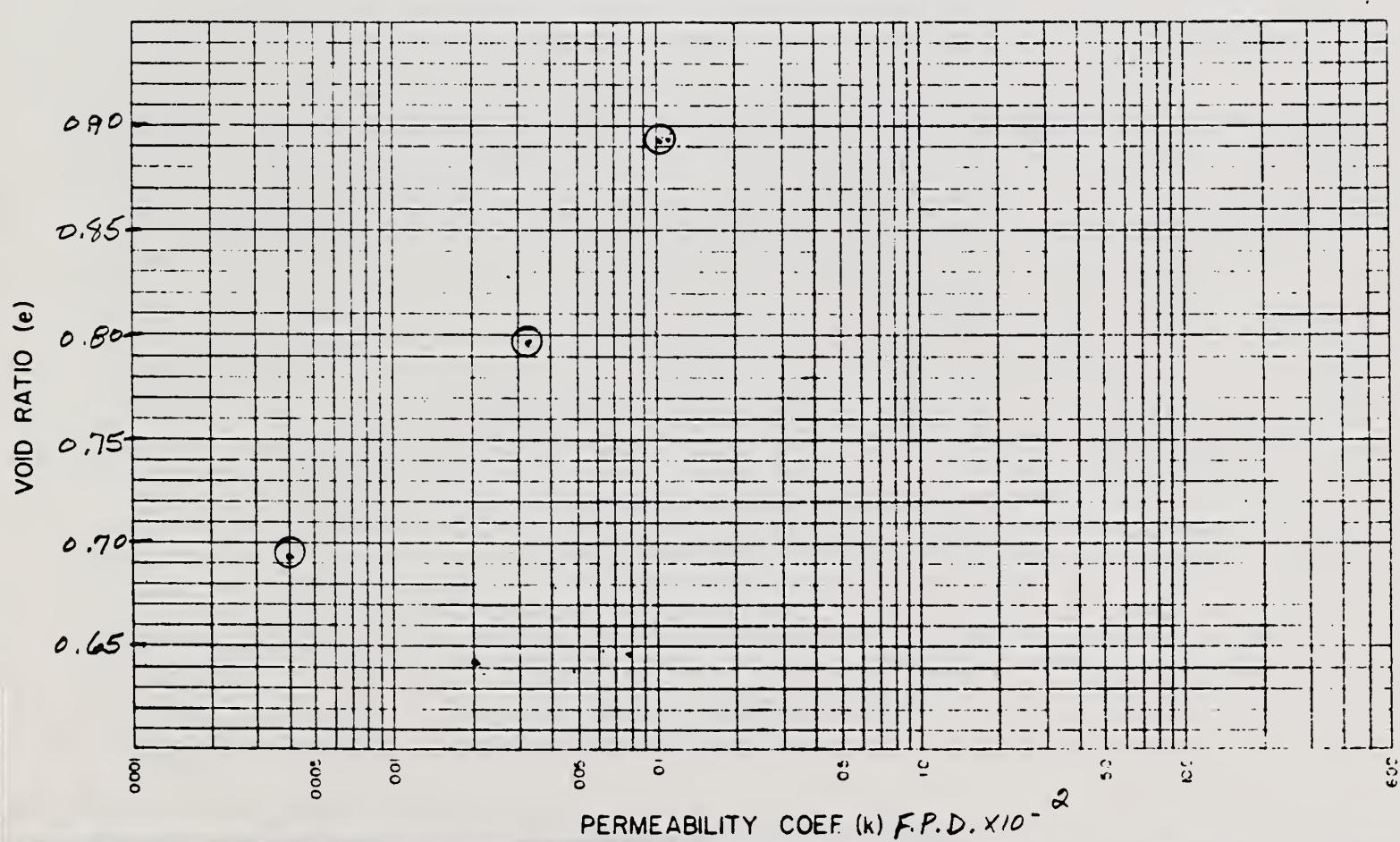
.00004

PERCOLATION COEF

H/L DURING TEST

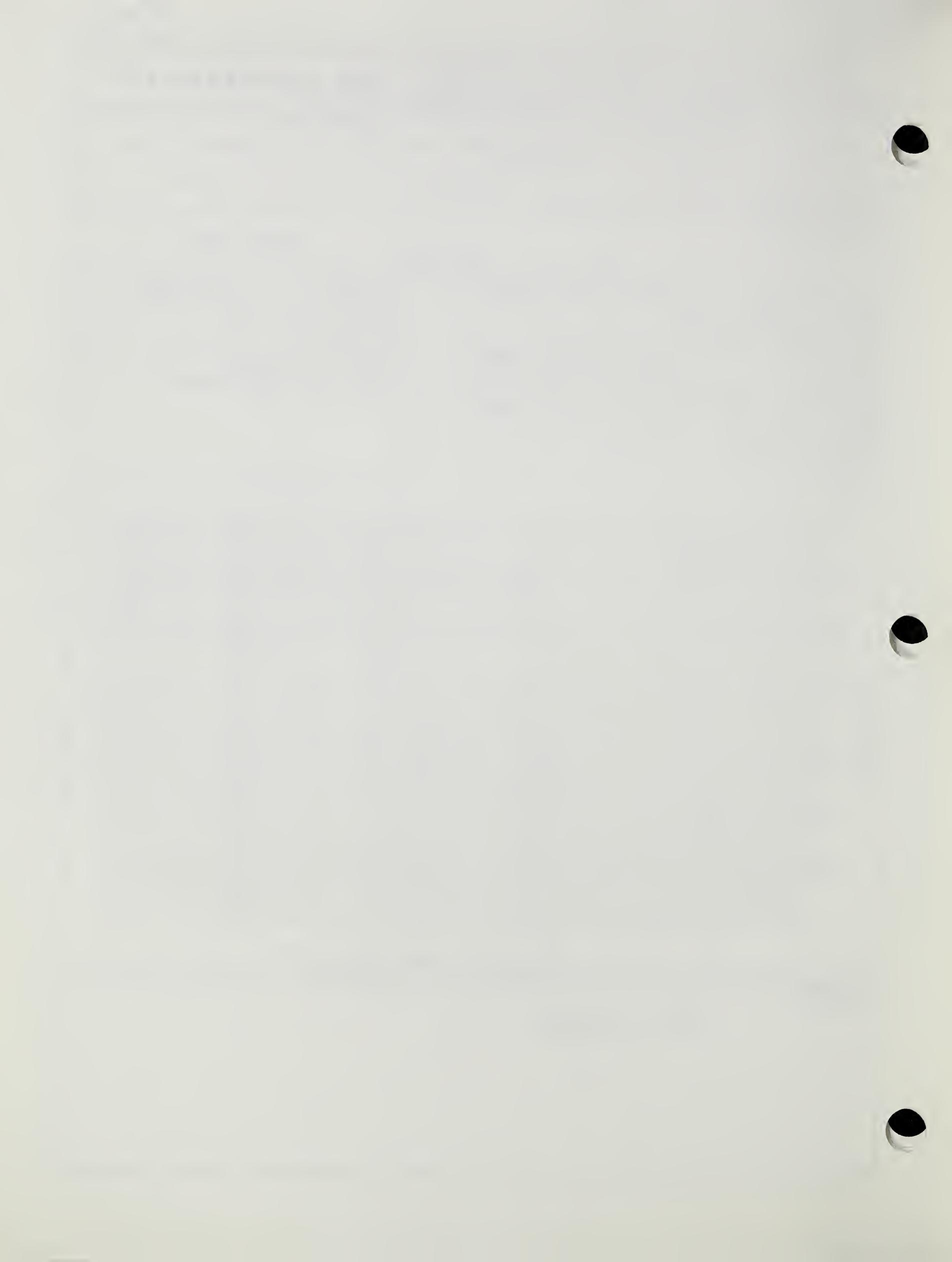
TEST SPECIFICATIONS

Falling Head Perm



REMARKS

 $C_o = 1.307$



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

WePP - Sharpsburg - Lincoln, NC

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

TESTED AT

APPROVED BY

DATE

Compacted

SML, Lincoln

CLASSIFICATION

CL LL 49 PI 30

SPECIFIC GRAVITY

TEST NO.

100

560

1000

2000

G_s(-) #4

2.63

INITIAL MOISTURE %

%

G_s(+) #4

DRY DENSITY

 g/cc
pcf

1.14

1.29

1.36

1.44

G_m(Bulk)(+) #4

VOID RATIO

1.3084

1.0424

.9307

.8222

TEST SPECIFICATIONS

PERMEABILITY COEF F.P.D.

5.7984

.05329

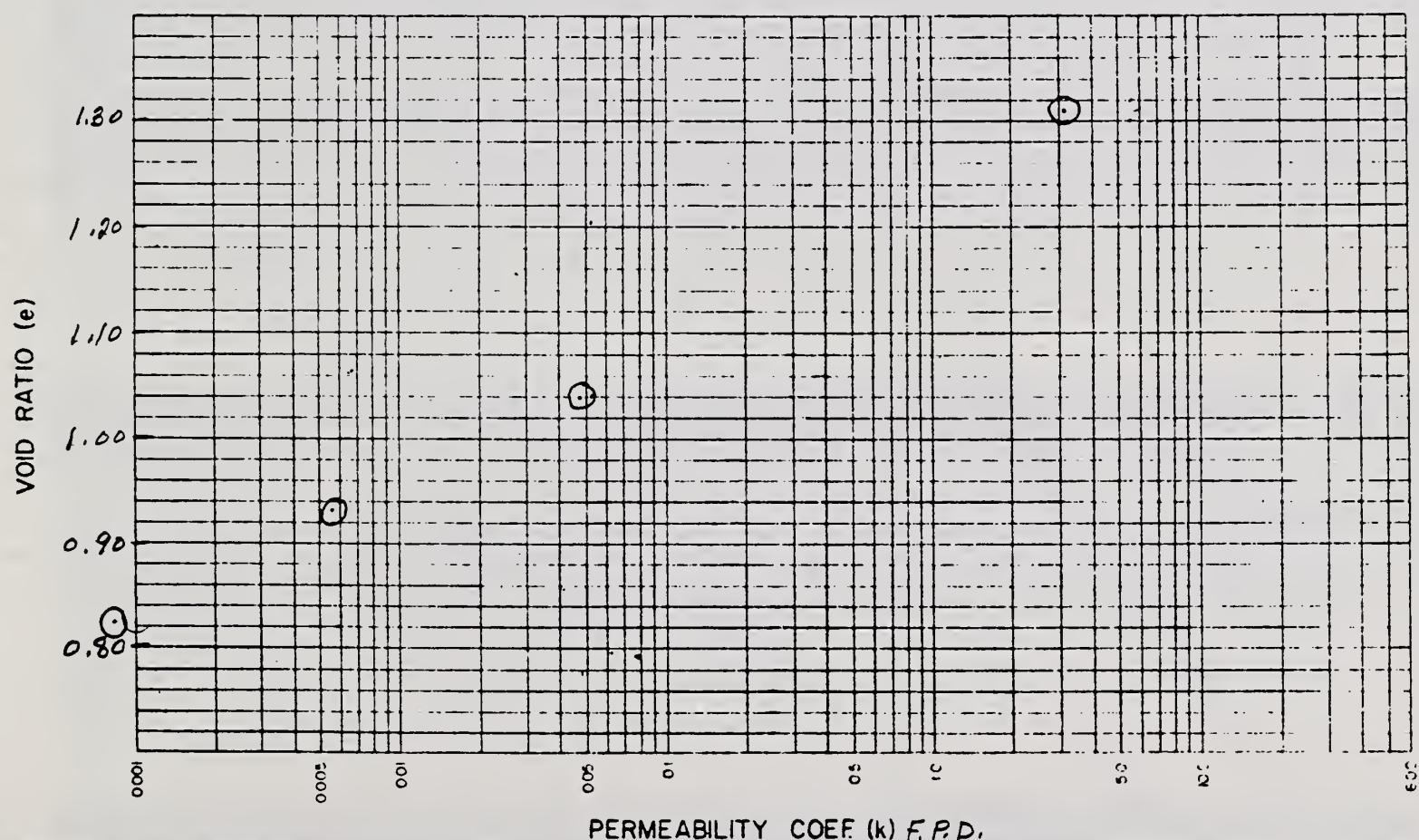
.00685

.00104

Falling Head Permeability

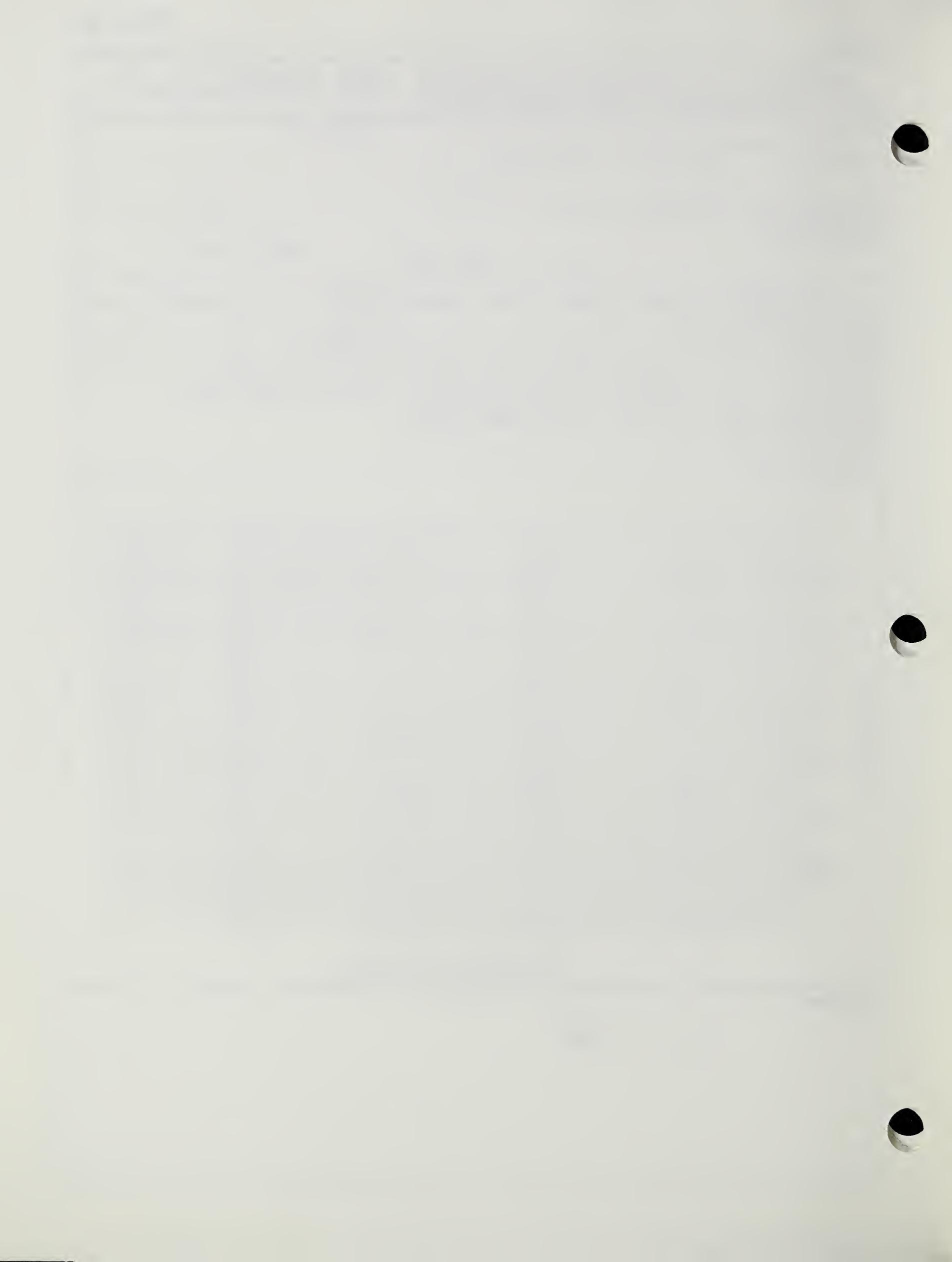
PERCOLATION COEF

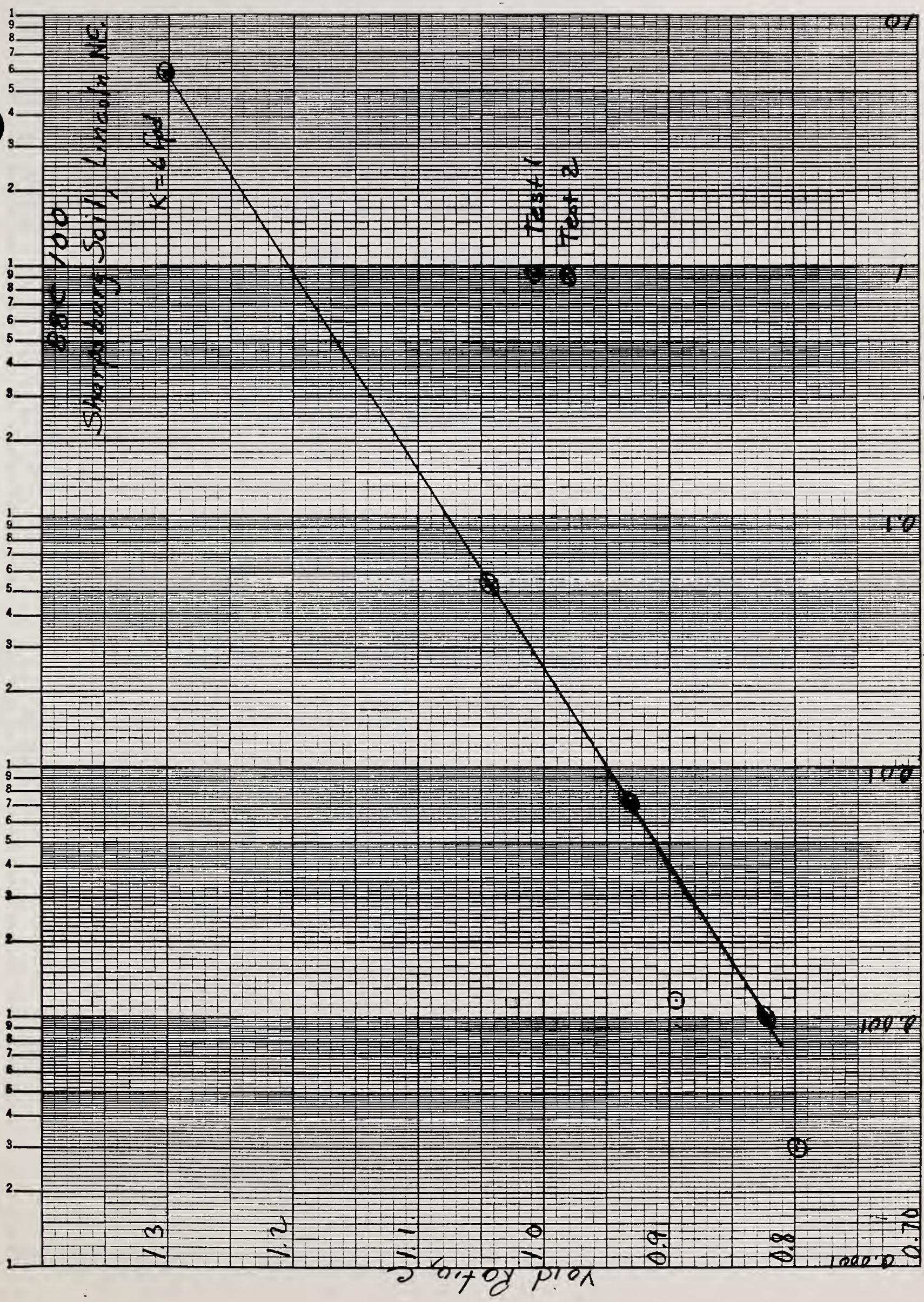
H/L DURING TEST



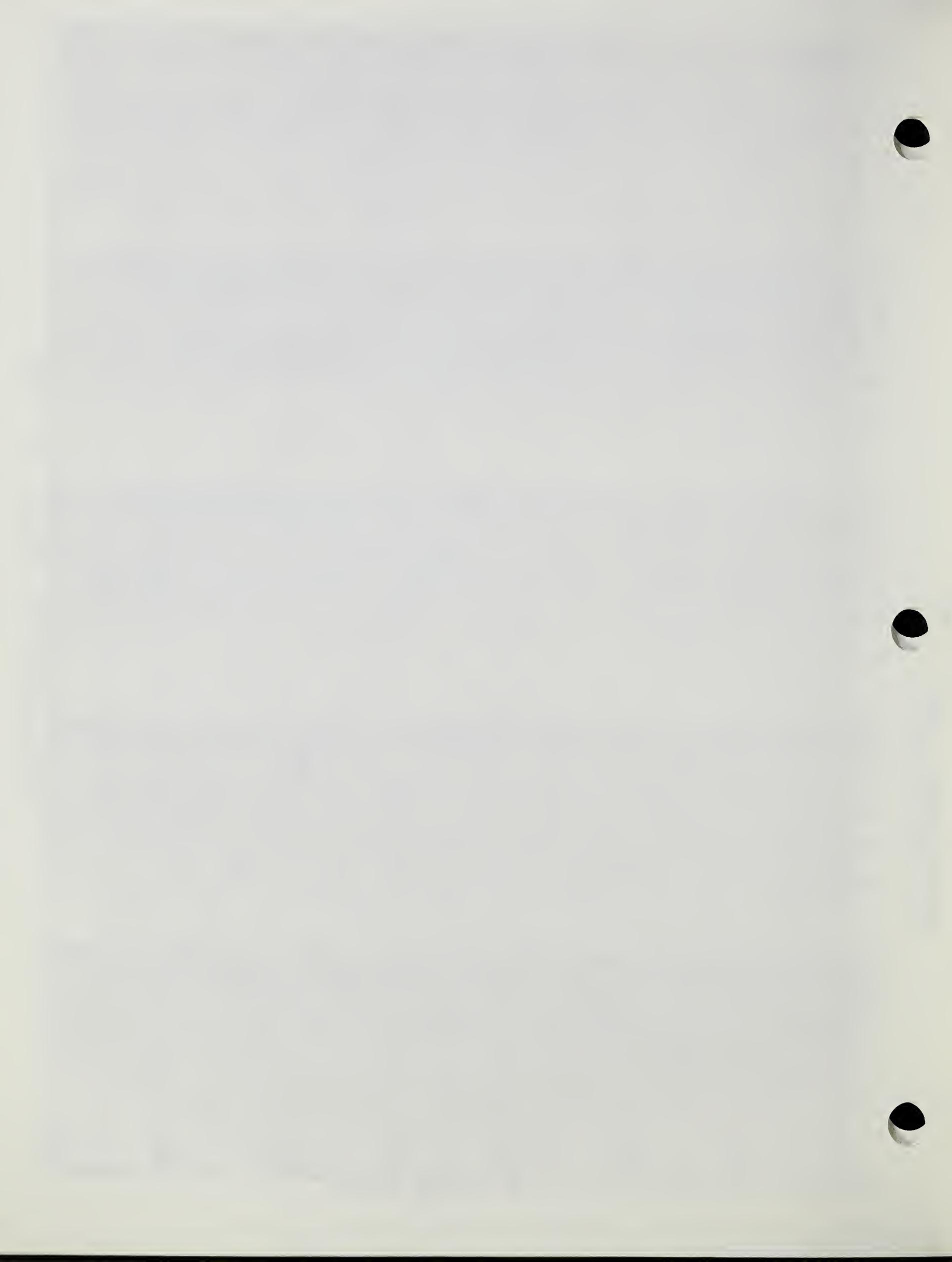
REMARKS

$$e_0 = 1.307$$





Permeability Coef. κ fpd



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

WePP - Sverdrup, Morris, MN.

SAMPLE LOCATION

FIELD SAMPLE NO.

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE
Compacted

TESTED AT

SML, Lincoln

APPROVED BY

DATE

CLASSIFICATION

SC

LL 25 PI 9

SPECIFIC GRAVITY

TEST NO.

2000 4000 8000

4

 $G_s (-)^4$

2.63

INITIAL MOISTURE %

 $G_s (+)^4$

DRY DENSITY

 g/cc
pcf

1.74 1.79 1.84

 $G_m (\text{Bulk}) (+)^4$

VOID RATIO

.5104 .4715 .4291

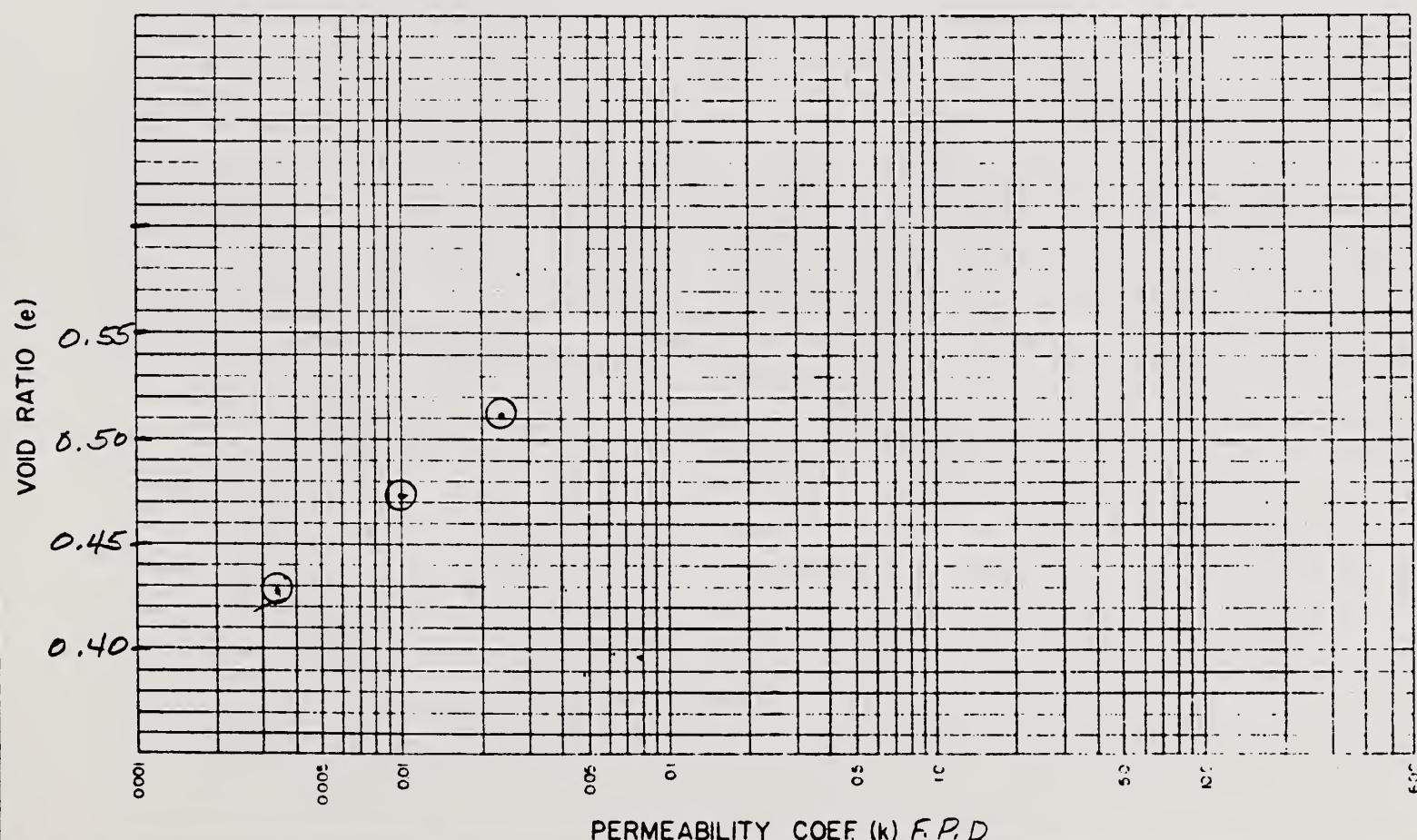
TEST SPECIFICATIONS

PERMEABILITY COEF.

F.P.D. .02443 .01039 .00343

Falling Head Perme.

PERCOLATION COEF

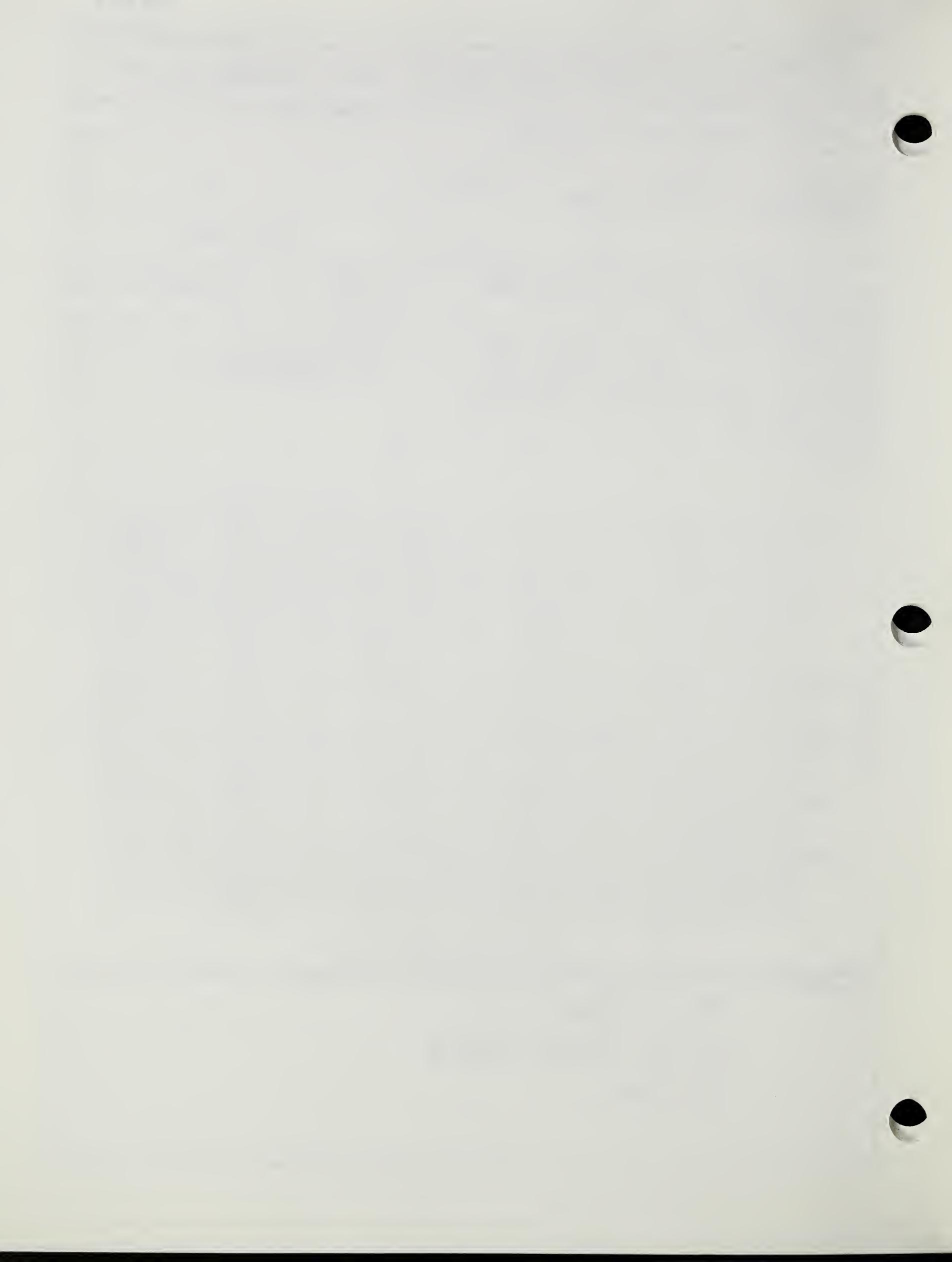
 H_L DURING TEST

REMARKS

$$e_0 = 0.801$$

Volume Change = 20.7%

K at $e_0 =$



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

We PP - Sverdrup - Morris, MN.

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

TESTED AT

APPROVED BY

DATE

Compacted

SML, Lincoln

CLASSIFICATION

SC LL~~25~~ PI 9

SPECIFIC GRAVITY

TEST NO.

100

500

1000

2000

G_s(-) #4

2.63

INITIAL MOISTURE %

G_s(+) #4

DRY DENSITY

 g/cc
pcf

1.48

1.62

1.69

1.75

G_m(Bulk)(+) #4

VOID RATIO

.7777

.6195

.5588

.5032

TEST SPECIFICATIONS

Falling Head Permeability

PERMEABILITY COEF F.P.D.

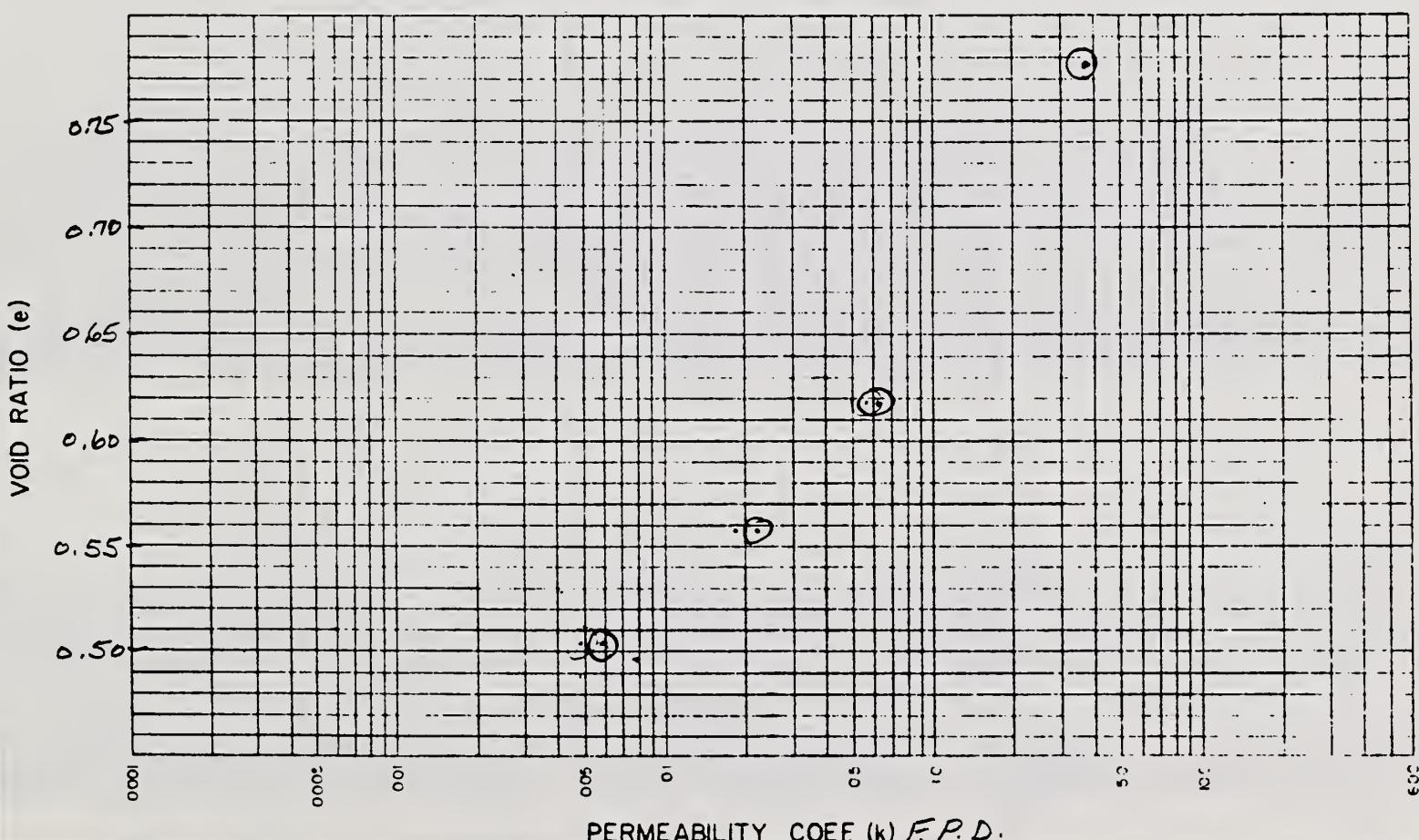
3.7722

.6268

.21954

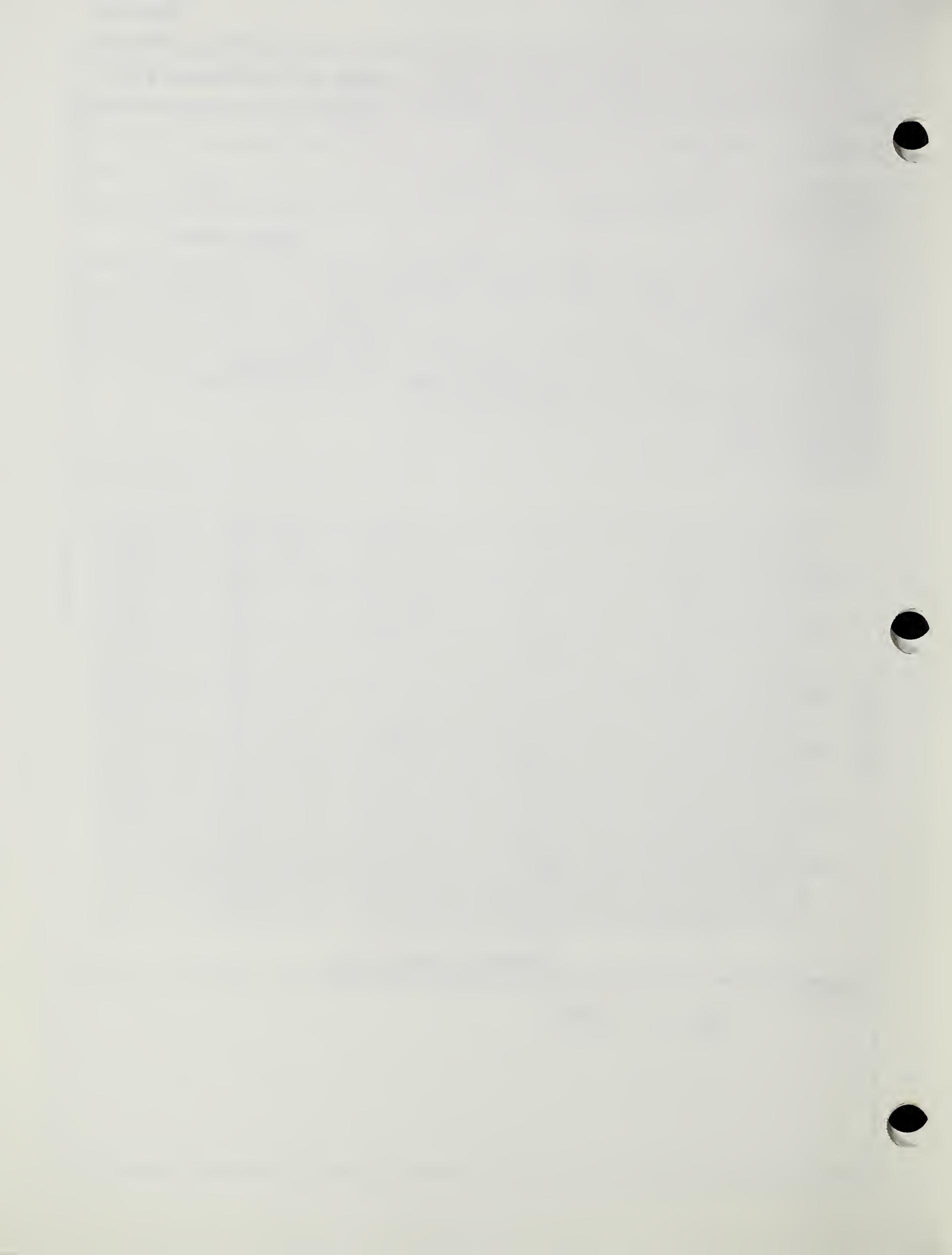
.05891

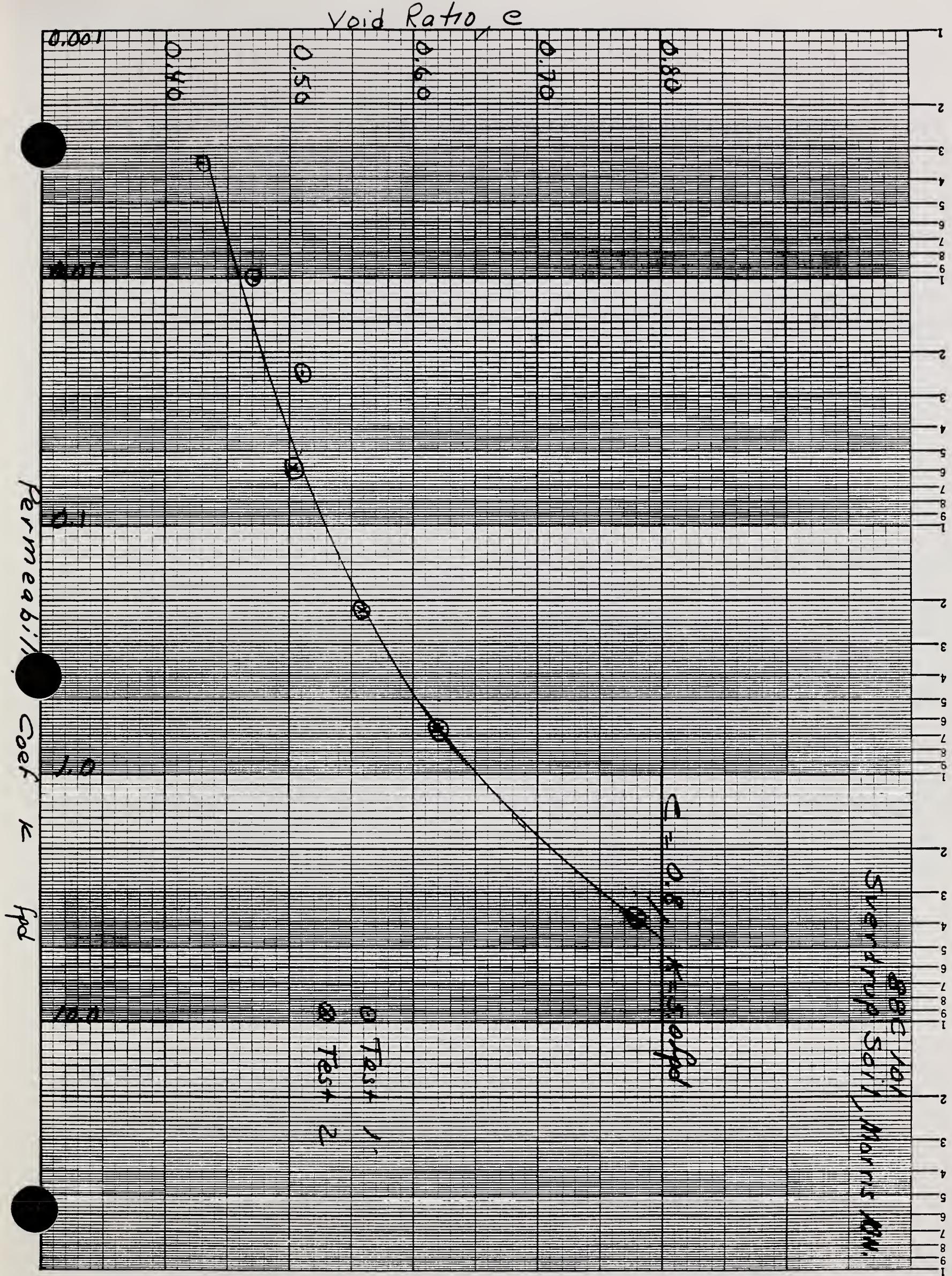
PERCOLATION COEF

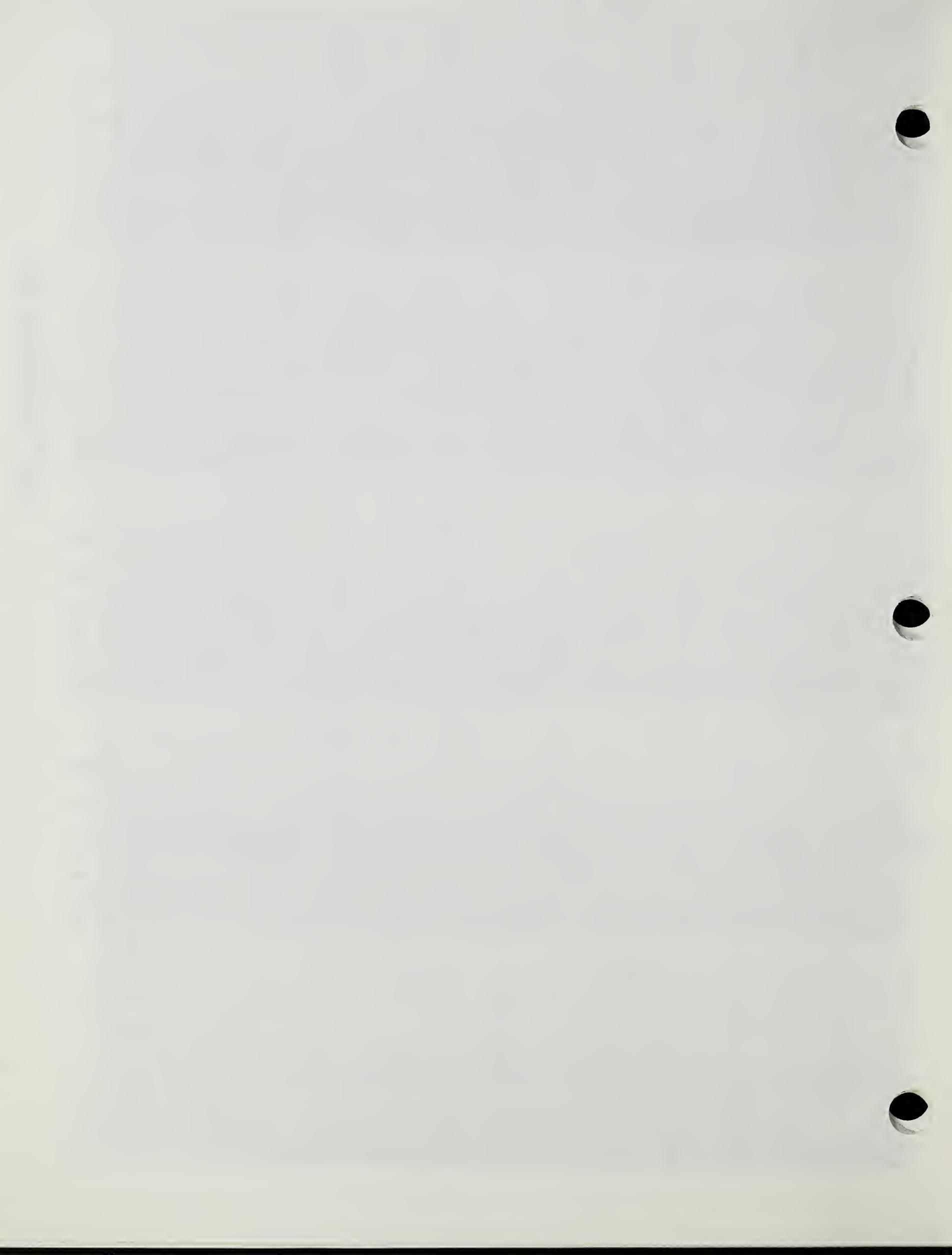
H_L DURING TEST

REMARKS

$$e_0 = 0.801$$







MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

WePP- Walla Walla - Pullman, WA.

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

Compacted

TESTED AT

SML, Lincoln

APPROVED BY

DATE

CLASSIFICATION

CL-ML LL 28 PI 4

SPECIFIC GRAVITY

TEST NO.

2000

4800

8000

4

 $G_s (-)^* 4$

2.65

INITIAL MOISTURE %

 $G_s (+)^* 4$ DRY DENSITY $\square \text{ g/cc}$ $\square \text{pcf}$

1.40

1.45

1.51

 $G_m (\text{Bulk}) (+)^* 4$

VOID RATIO

.8969

.8320

.7589

TEST SPECIFICATIONS

PERMEABILITY COEF F.P.D.

.04369

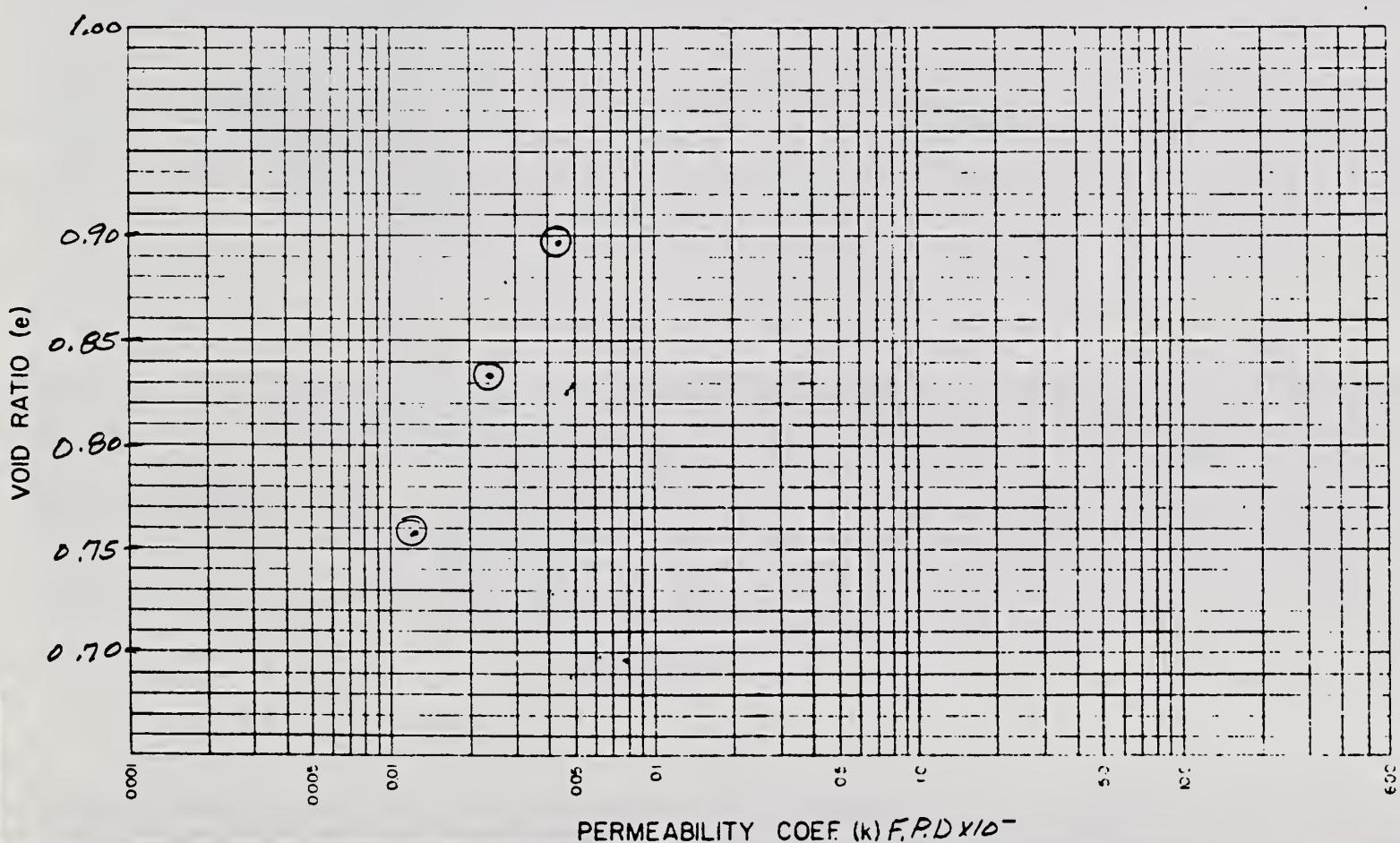
.02458

.01389

Falling Head Perm.

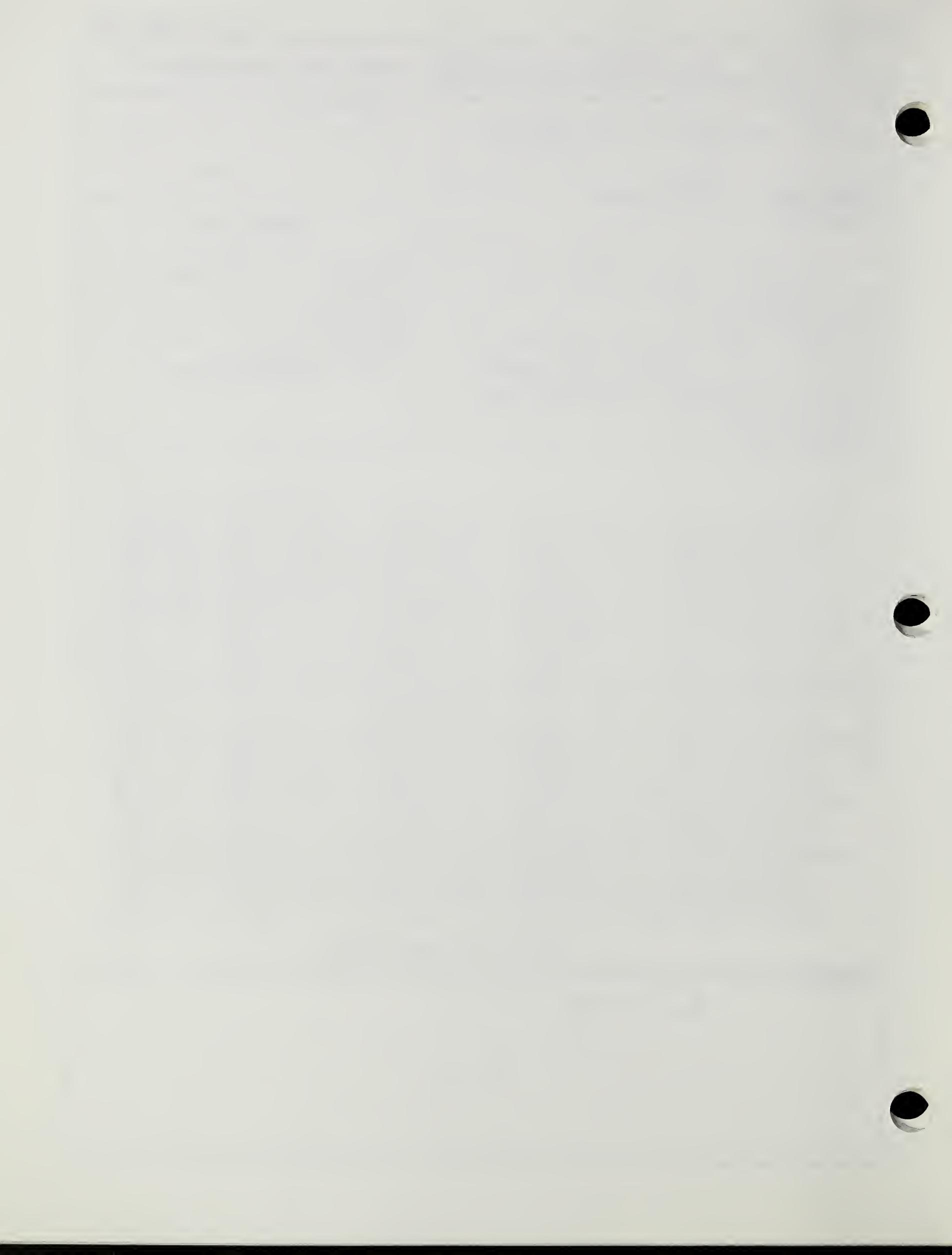
PERCOLATION COEF

H/L DURING TEST

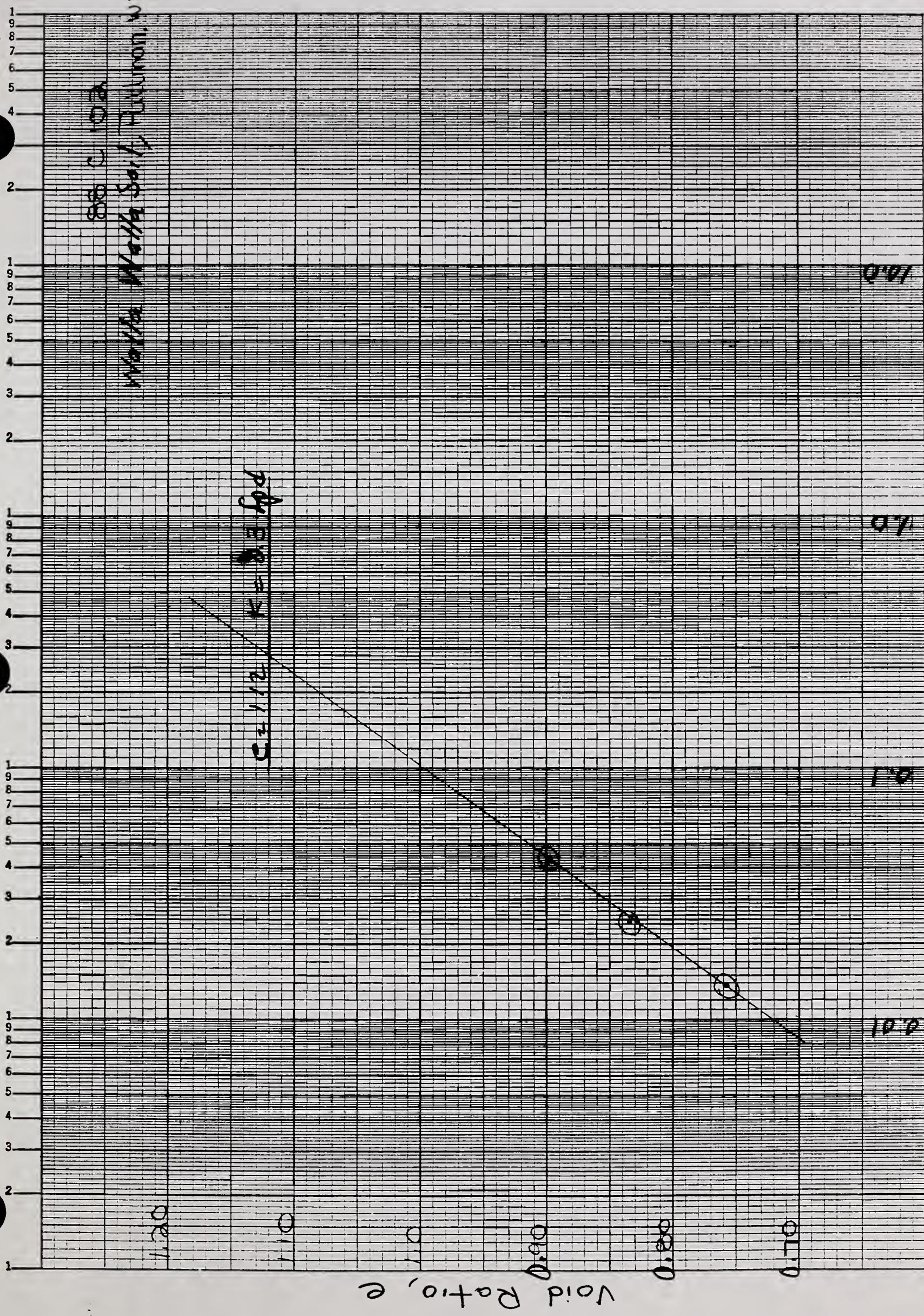


REMARKS

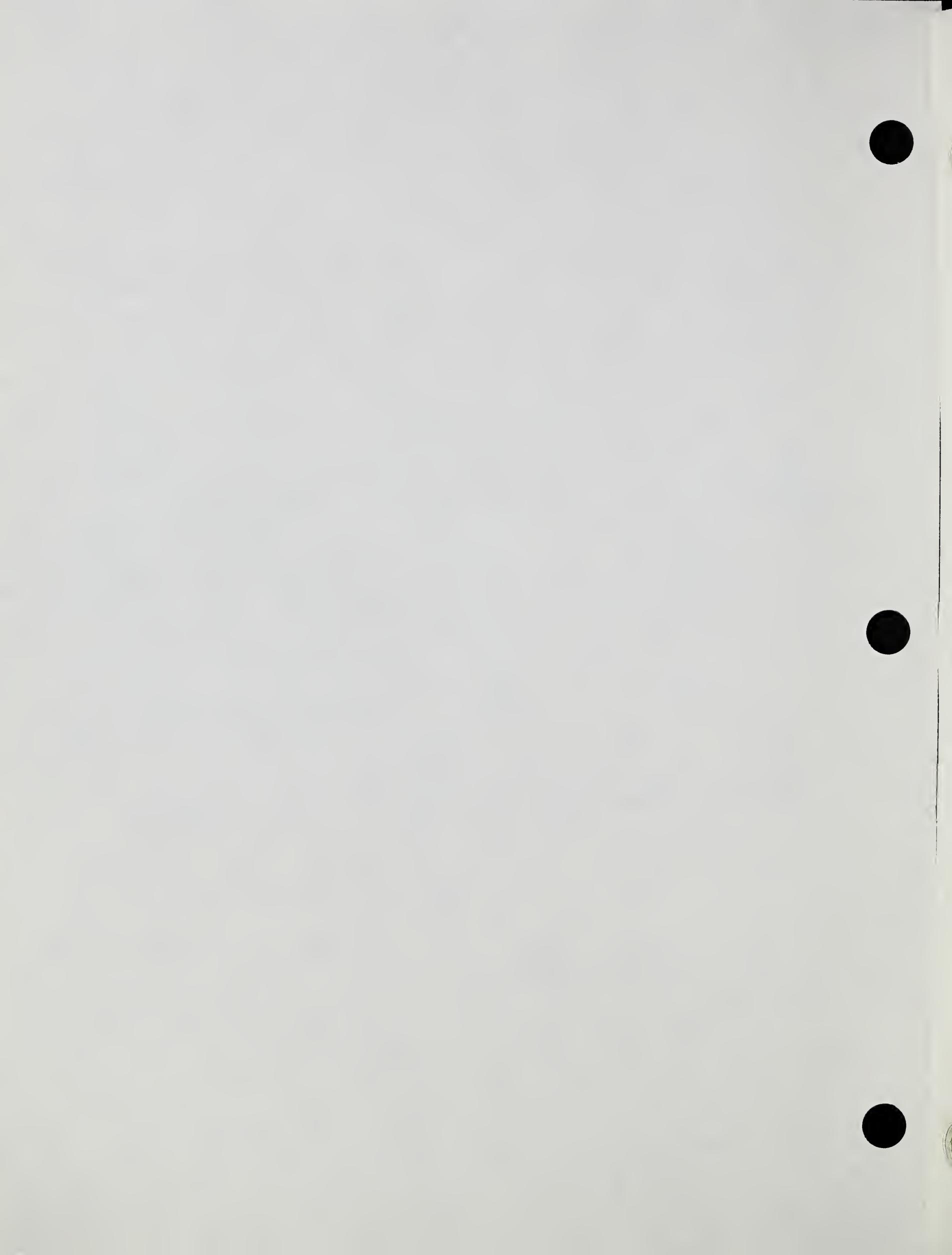
$$e_0 = 1.12$$



K \cdot Σ SEMI-LOGARITHMIC 359-91G
KEUFFEL & ESSER CO. MADE IN U.S.A.
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Permeability Coef., K fpm



MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

WePP Whitney - Fresno, CA.

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

TESTED AT

SML, Lincoln

APPROVED BY

DATE

Compacted

CLASSIFICATION

None Plastic SM LL PI

SPECIFIC GRAVITY

TEST NO

2000

4000

8000

4

 $G_s (-)^* 4$

2.67

INITIAL MOISTURE %

 $G_s (+)^* 4$ DRY DENSITY g/cc

1.95

1.90

1.95

 $G_m (\text{Bulk}) (+)^* 4$

VOID RATIO

4402

4080

3709

TEST SPECIFICATIONS

PERMEABILITY COEF F.P.D.

0.2646

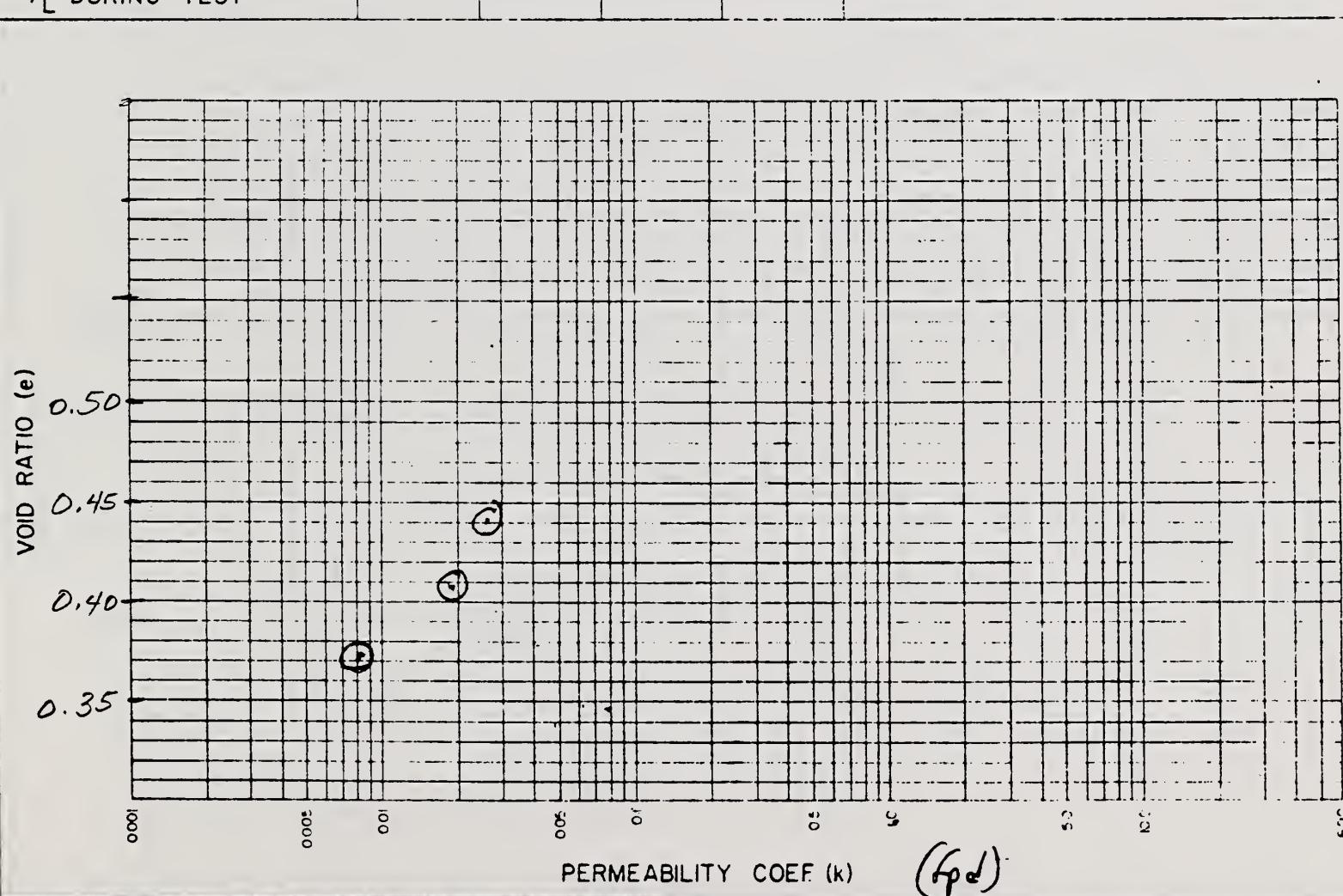
0.1906

0.00836

Falling Head Perme.

PERCOLATION COEF

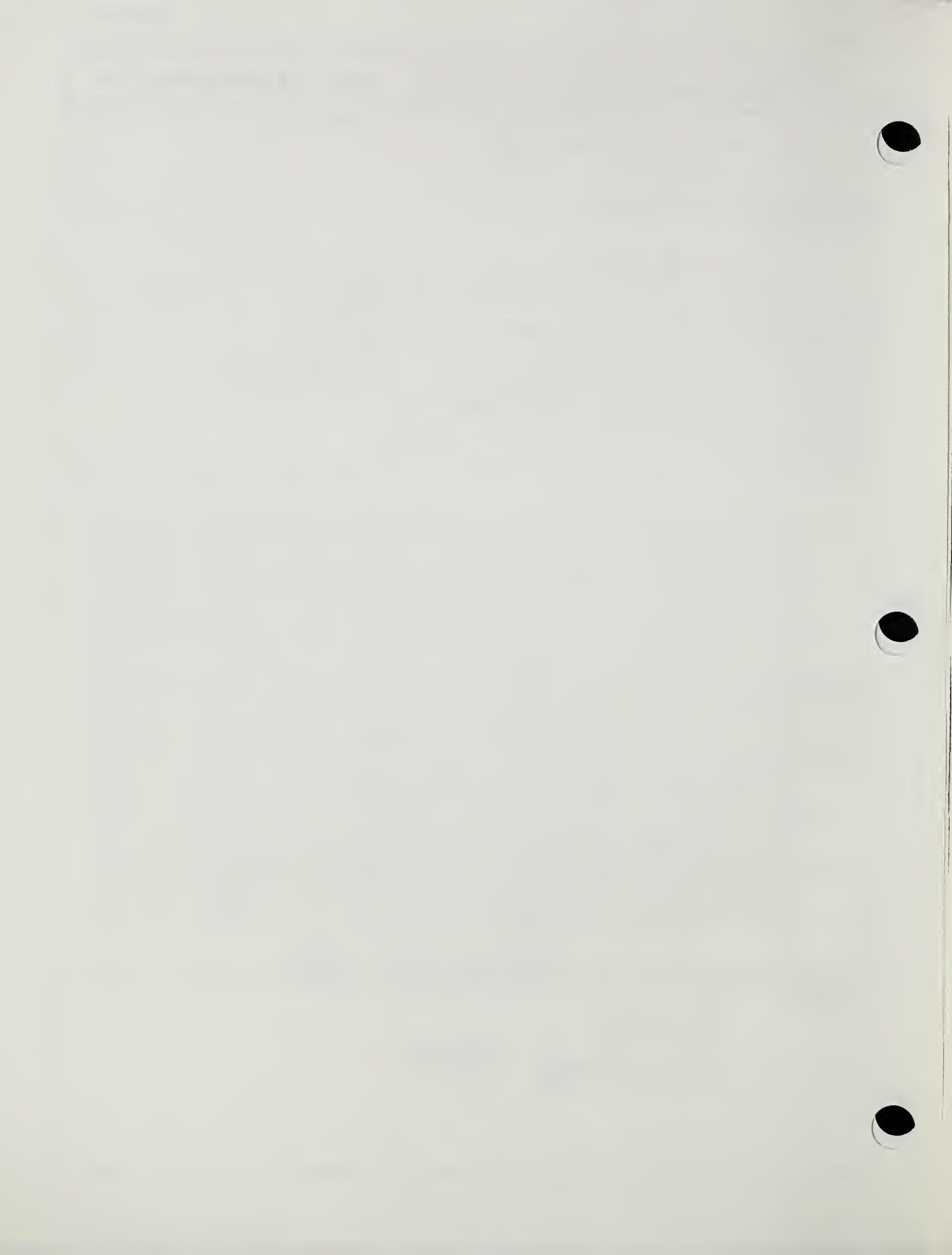
H/L DURING TEST



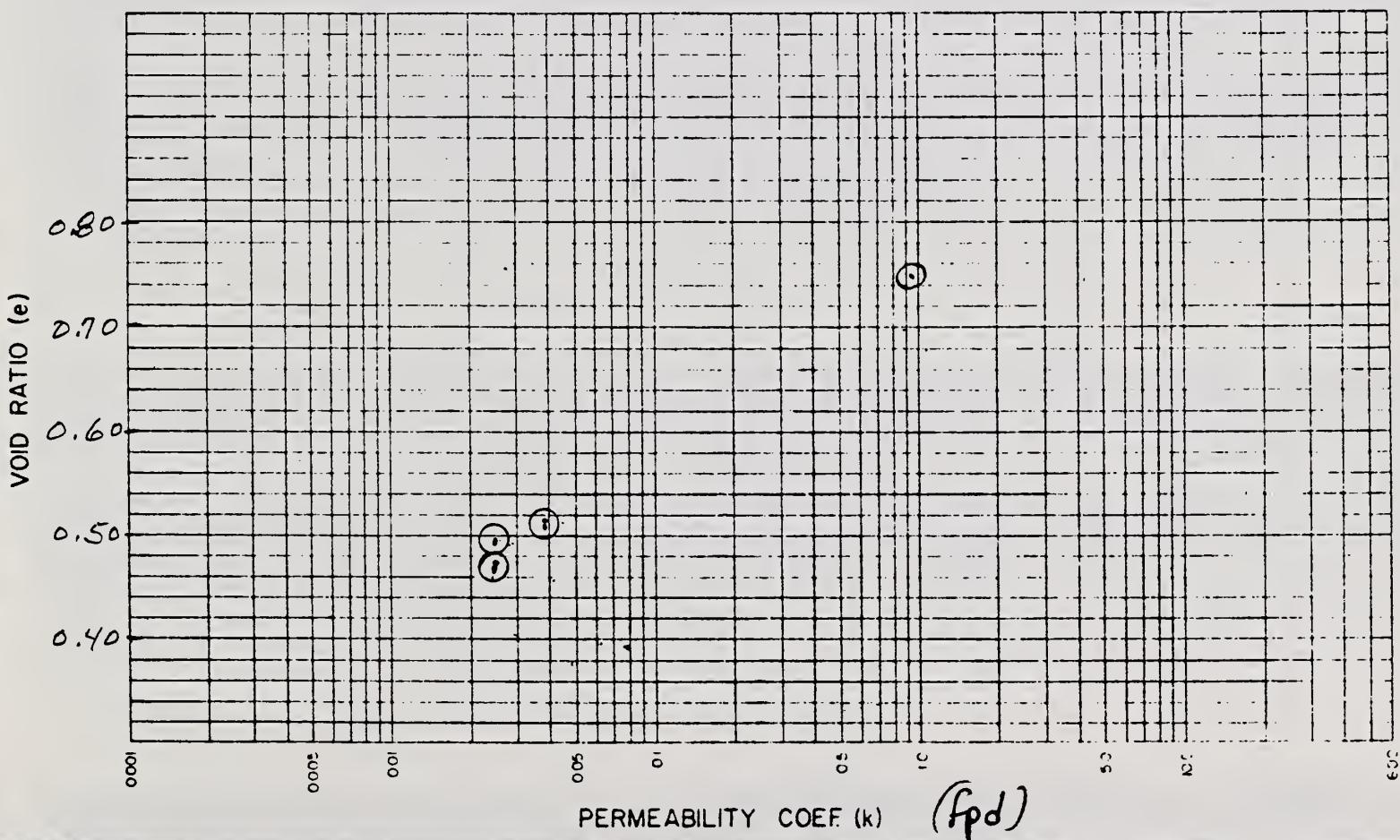
REMARKS

$$e_0 = 0.734$$

Volume Change - 20.9%

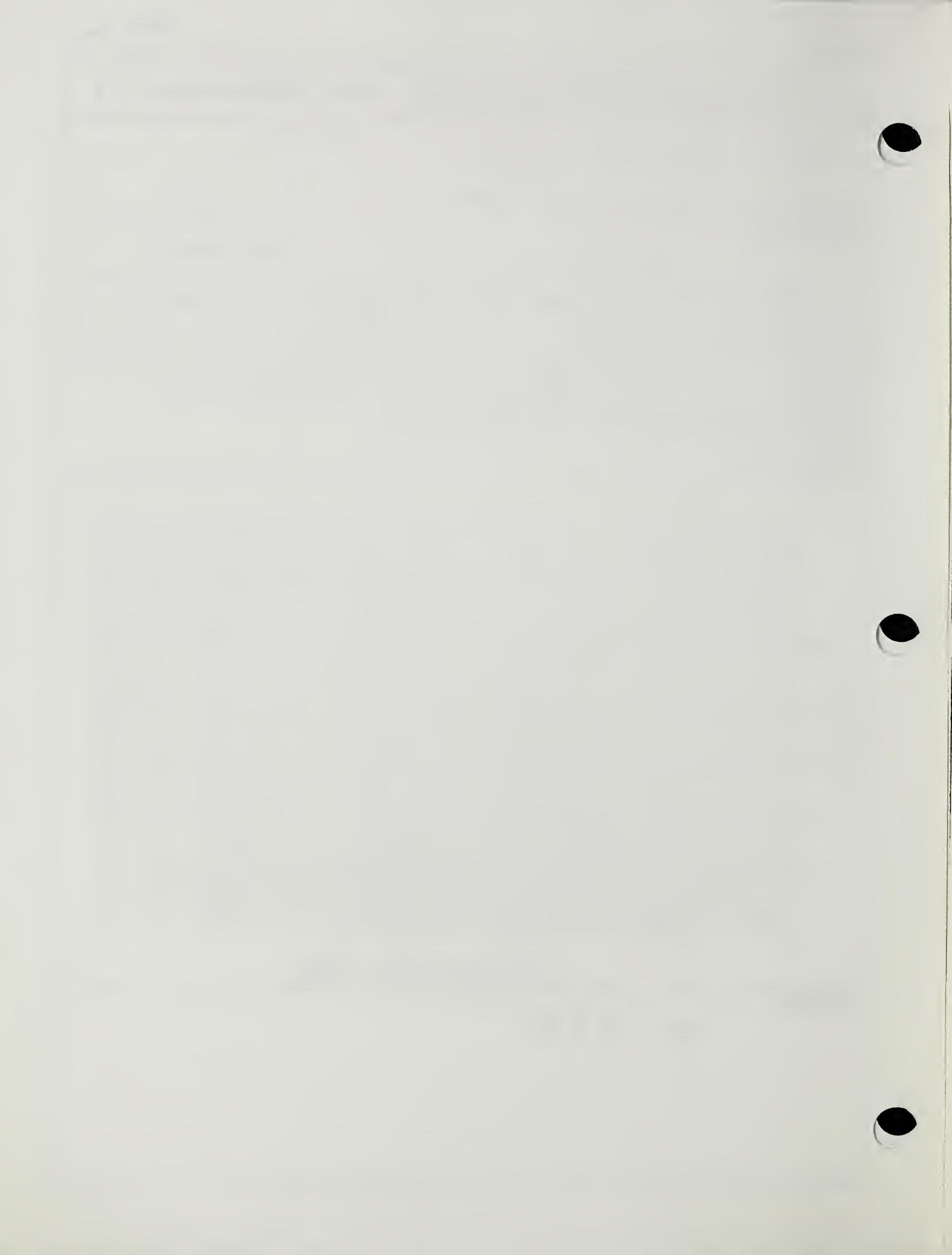


MATERIALS TESTING REPORT		U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY	
PROJECT AND STATE WEPP - FRESNO, CA.				SAMPLE LOCATION	
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE Compacted	TESTED AT SML, Lincoln	APPROVED BY		DATE	
CLASSIFICATION NON-PLASTIC SM LL PI				SPECIFIC GRAVITY	
TEST NO.	100	500	1000	2000	$G_s (-)^{\#4}$
INITIAL MOISTURE %					$G_s (+)^{\#4}$
DRY DENSITY □ g/cc □pcf	1.53	1.76	1.79	1.81	$G_m (\text{Bulk}) (+)^{\#4}$
VOID RATIO	.7447	.5167	.4950	.4737	TEST SPECIFICATIONS Falling Head Perme.
PERMEABILITY COEF. F.P.D.	.94641	.03901	.02547	.02579	
PERCOLATION COEF					
H/L DURING TEST					

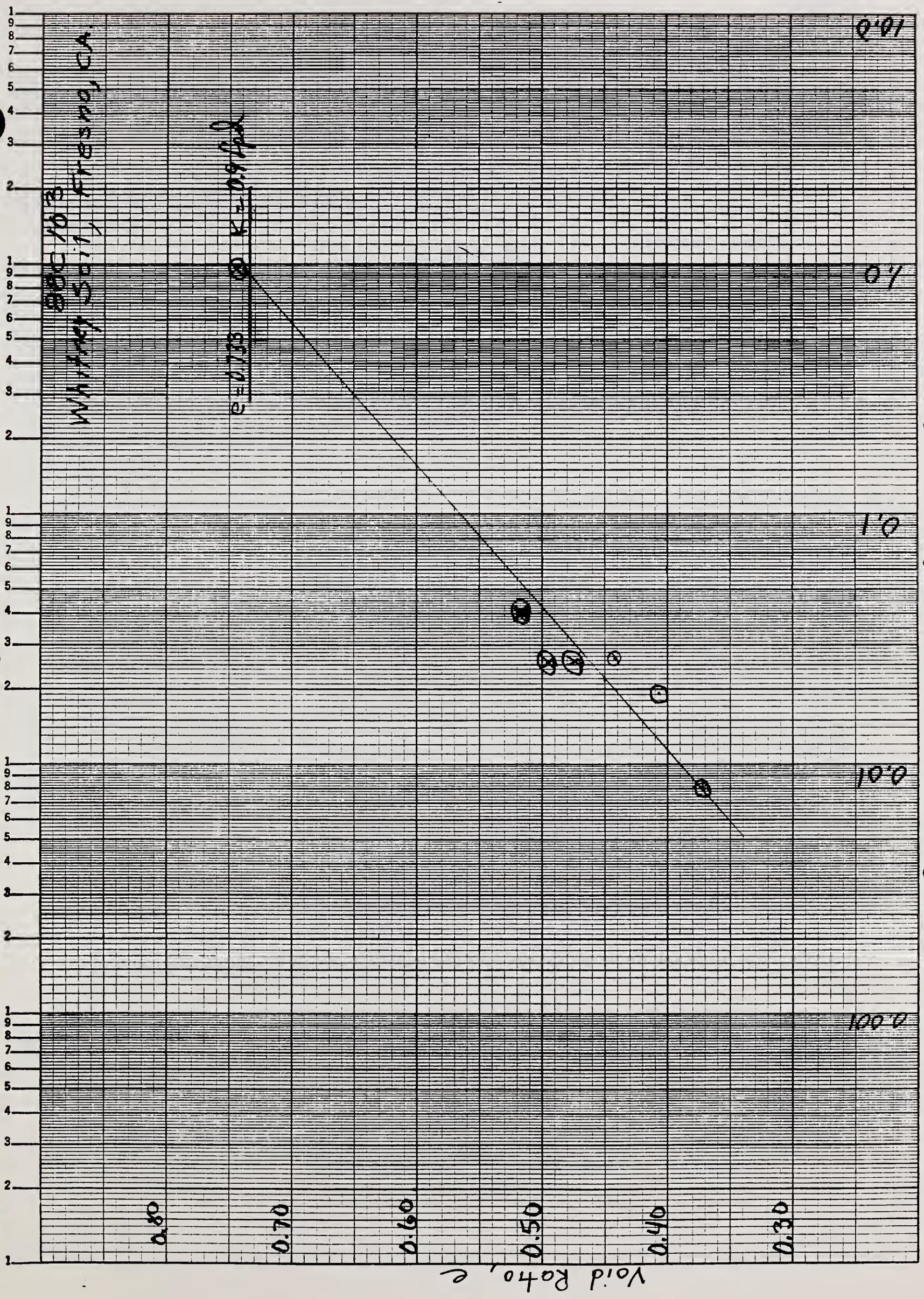


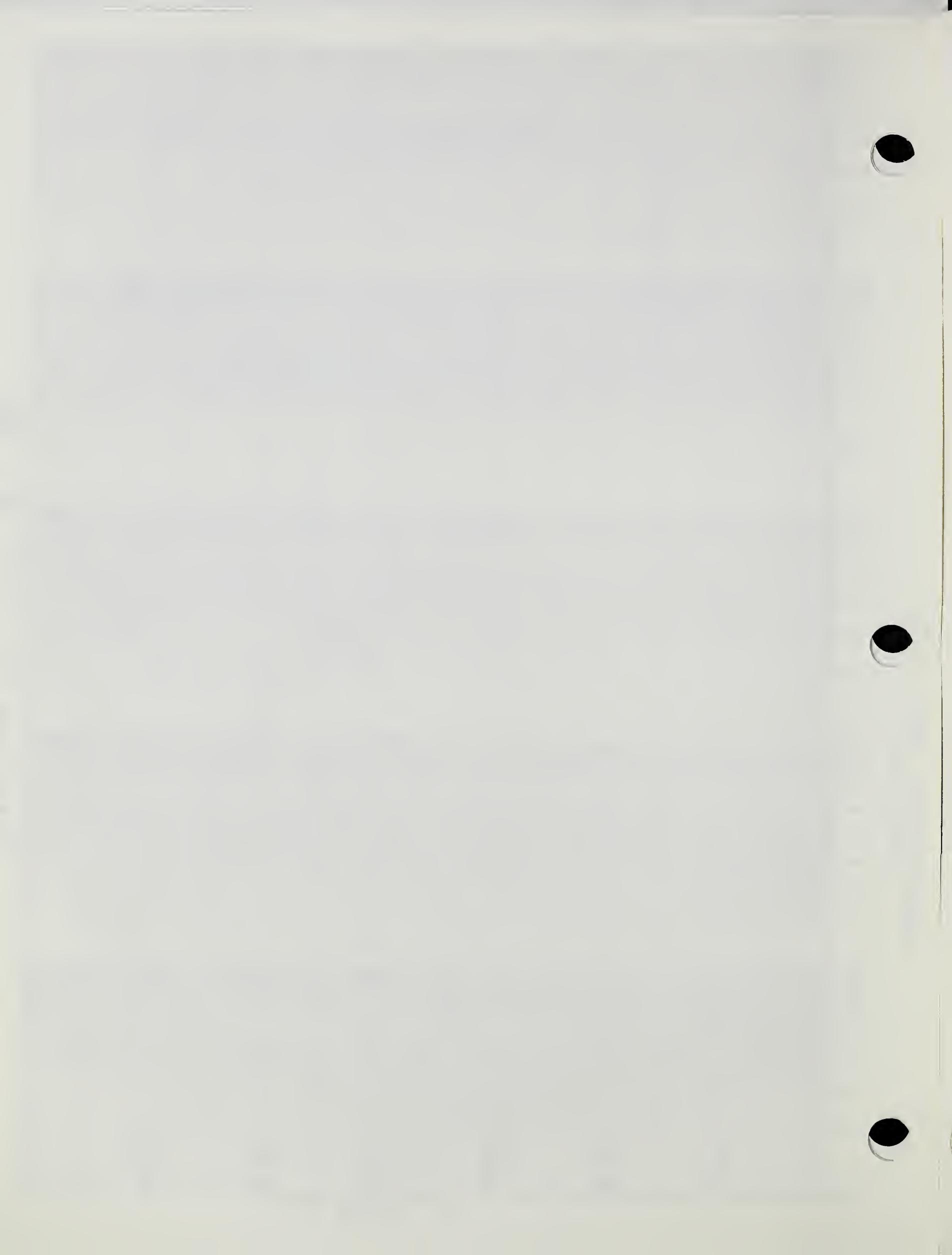
REMARKS

$$e_0 = 0.733$$



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MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

WePP - Williams - McClusky, ND.

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

Compacted

TESTED AT

SML, Lincoln

APPROVED BY

DATE

CLASSIFICATION

CL LL 37 PI 19

SPECIFIC GRAVITY

TEST NO.

2000

4080

8000

4

 $G_s (-)^* 4$

2.59

INITIAL MOISTURE %

 $G_s (+)^* 4$ DRY DENSITY $\frac{\text{g/cc}}{\text{pcf}}$

1.57

1.65

1.74

 $G_m (\text{Bulk}) (+)^* 4$

VOID RATIO

1.6480

1.5685

1.4865

PERMEABILITY COEF F.P.D.

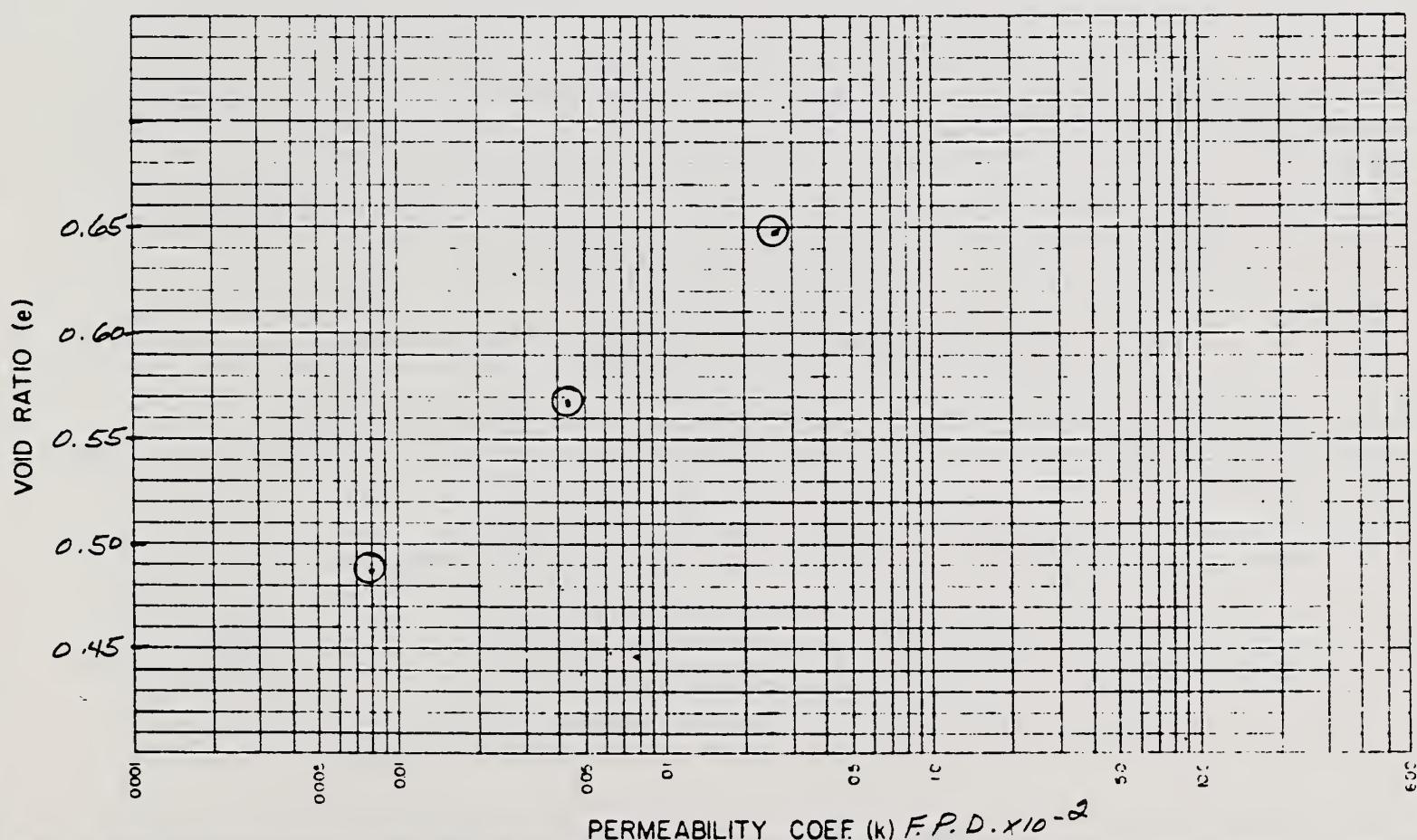
.00279

.00043

.00008

PERCOLATION COEF

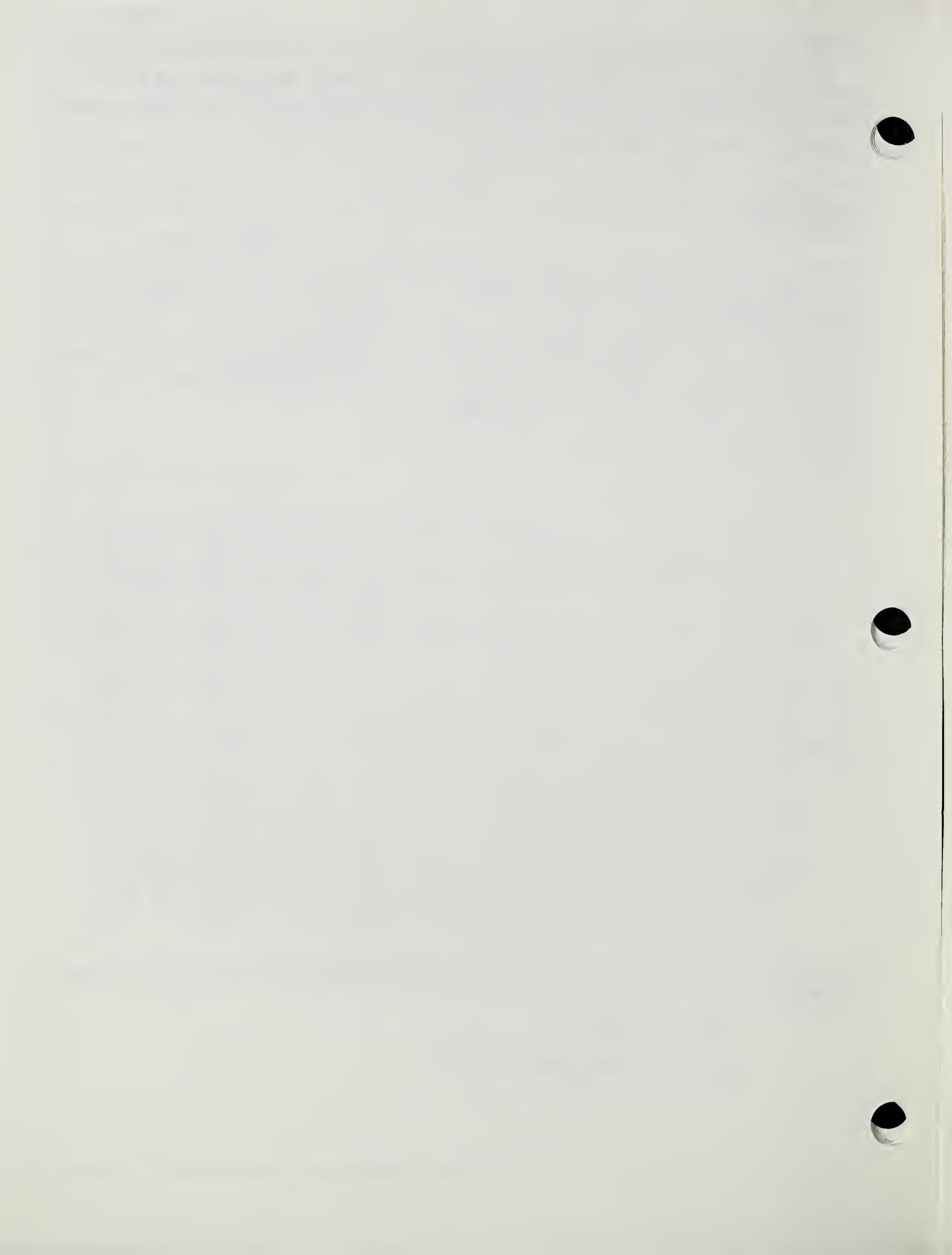
H/L DURING TEST

TEST SPECIFICATIONS
Falling Head Perm.

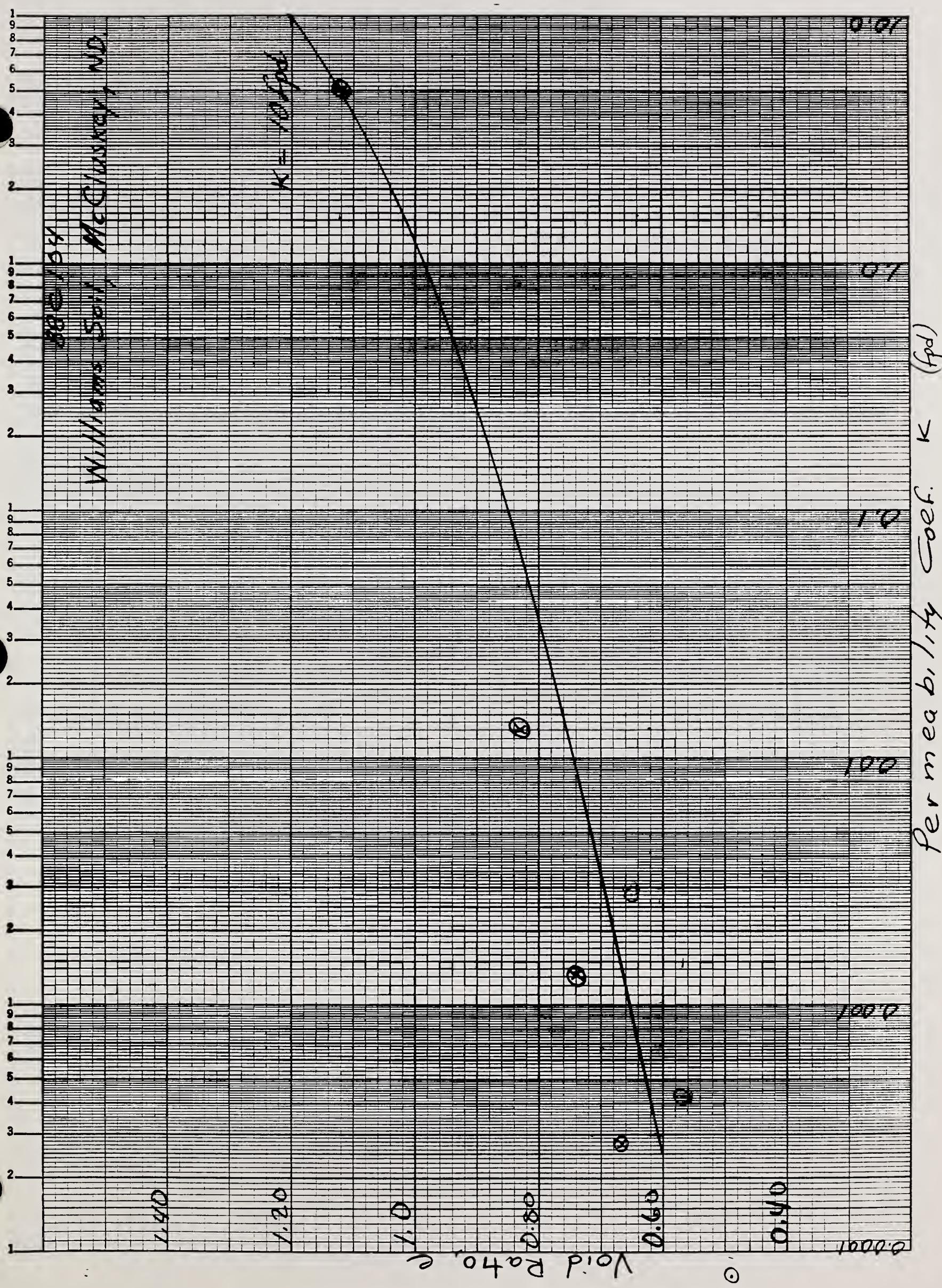
REMARKS

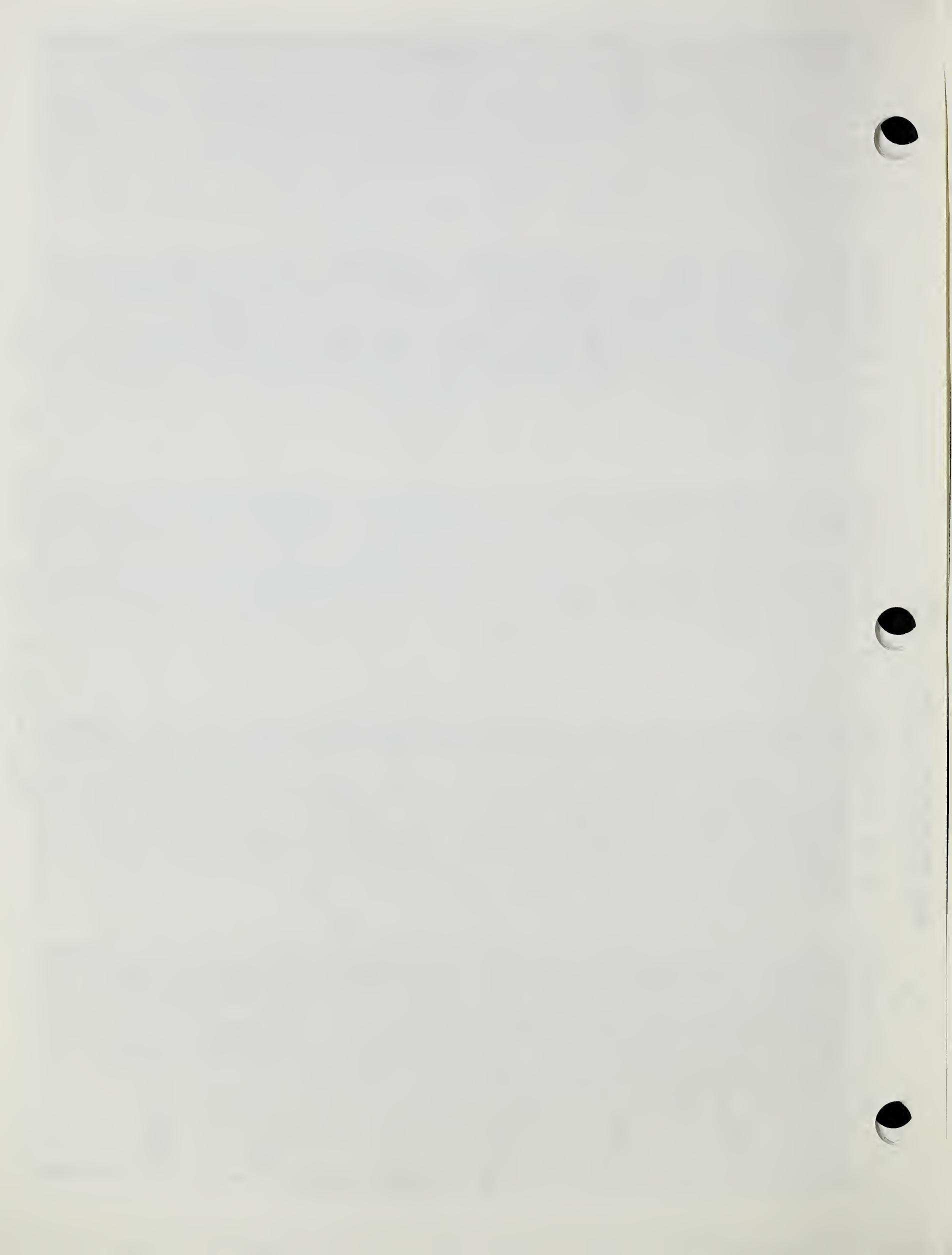
 $C_0 = 1.233$

Volume change = 33.4%



MATERIALS TESTING REPORT		U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY	
PROJECT AND STATE <i>WEPP - Williams - McClusky, ND.</i>		SAMPLE LOCATION			
FIELD SAMPLE NO	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE <i>Compacted</i>	TESTED AT <i>SML, Lincoln</i>	APPROVED BY			DATE
CLASSIFICATION		SPECIFIC GRAVITY			
TEST NO.	<i>100</i>	<i>580</i>	<i>1000</i>	<i>2000</i>	$G_s (-)^*4$
INITIAL MOISTURE %					$G_s (+)^*4$
DRY DENSITY <input type="checkbox"/> g/cc <input type="checkbox"/> pcf	<i>1.22</i>	<i>1.41</i>	<i>1.49</i>	<i>1.56</i>	$G_m(\text{Bulk})(+)^*4$
VOID RATIO	<i>1.1244</i>	<i>.8343</i>	<i>.7421</i>	<i>.6633</i>	TEST SPECIFICATIONS <i>Falling Head Perm.</i>
PERMEABILITY COEF F.P.D.	<i>5.0753</i>	<i>.01275</i>	<i>.00134</i>	<i>.00027</i>	
PERCOLATION COEF					
H _L DURING TEST					
REMARKS	$C_0 = 1.233$				





MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

We PP-

WOODWARD OK

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

Compacted

TESTED AT

SMU, Lincoln

APPROVED BY

DATE

CLASSIFICATION

LL PI

SPECIFIC GRAVITY

TEST NO.

2000

4000

8000

4

 $G_s (-)^* 4$

2.61

INITIAL MOISTURE %

 $G_s (+)^* 4$ DRY DENSITY $\frac{\text{g/cc}}{\text{pcf}}$

1.60

1.65

1.71

 $G_m (\text{Bulk}) (+)^* 4$

VOID RATIO

.6339 .5783 .5245

TEST SPECIFICATIONS

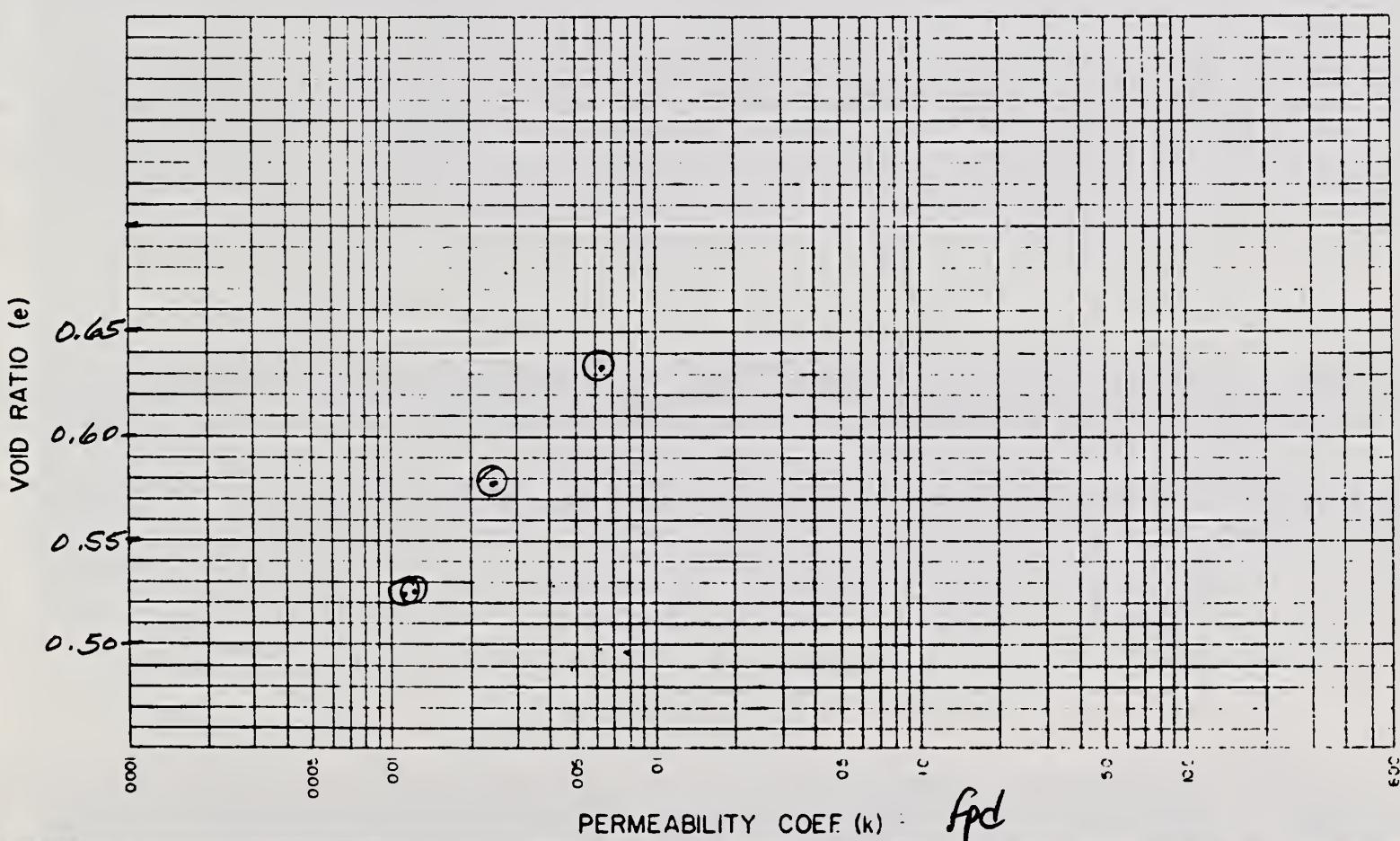
FALLING HEAD FER.M.

PERMEABILITY COEFF. F.P.D.

.06220 .02516 .01232

PERCOLATION COEF

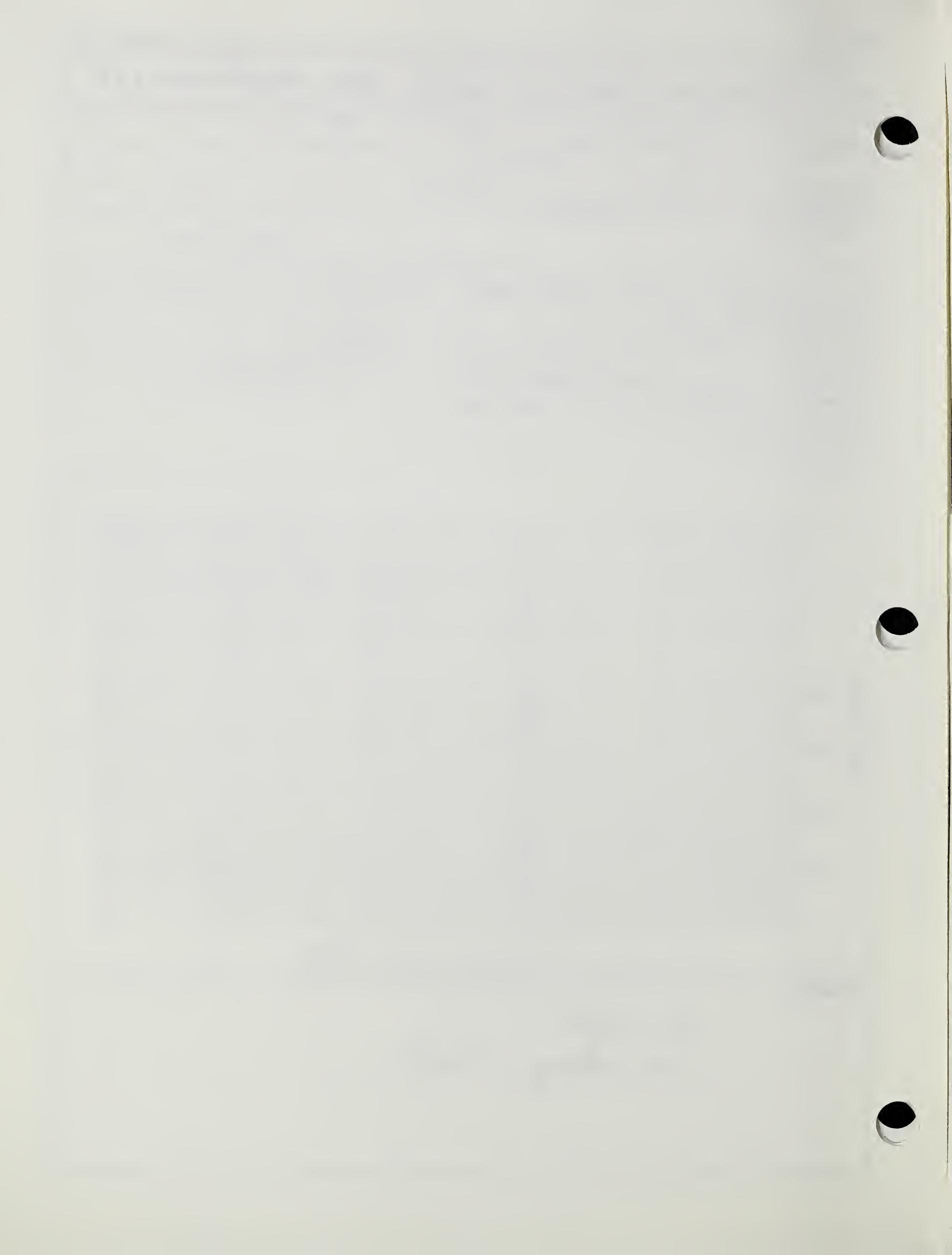
H/L DURING TEST



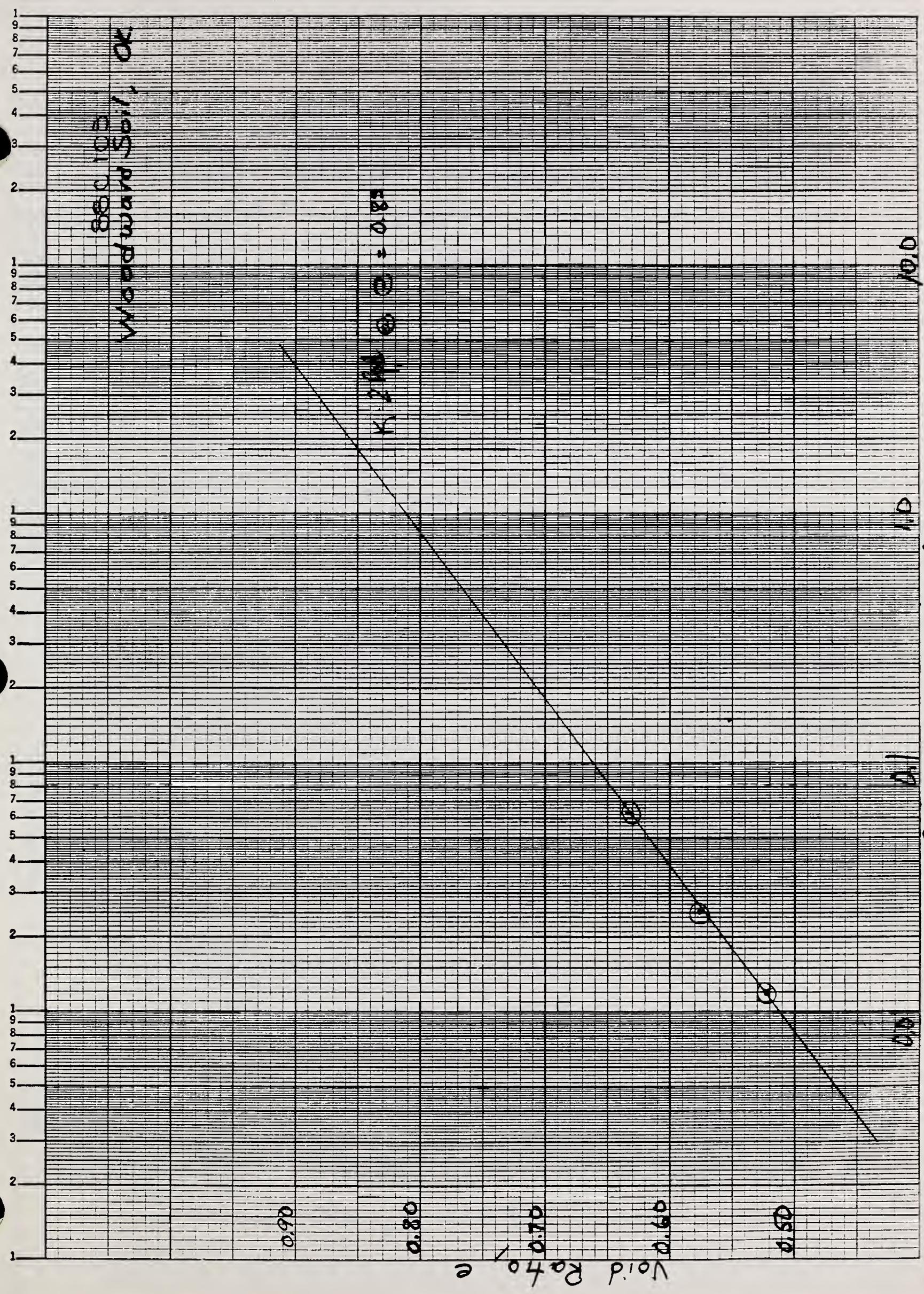
REMARKS

$$C_o = 0.851$$

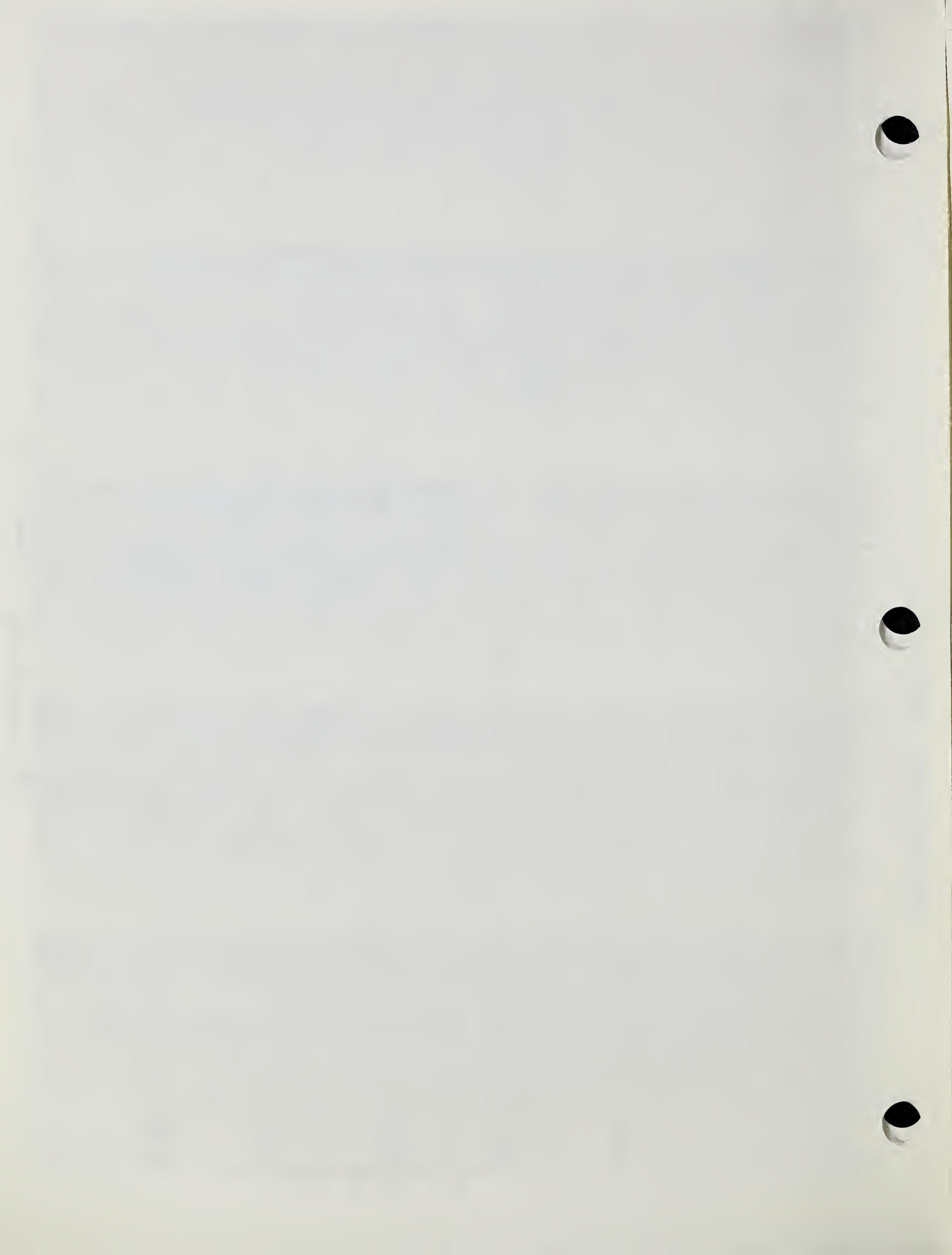
Volume change = 17.6%



Permeability Coef. K



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5 CYCLES X 70 DIVISIONS



Test 1

MATERIALS
TESTING REPORTU. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

SOIL PERMEABILITY

PROJECT AND STATE

WePP-

ZAHL ND.

SAMPLE LOCATION

FIELD SAMPLE NO

DEPTH

GEOLOGIC ORIGIN

TYPE OF SAMPLE

Compacted

TESTED AT

SML - Lincoln

APPROVED BY

DATE

CLASSIFICATION

LL PI

SPECIFIC GRAVITY

TEST NO

2000 4000 8000

G_s(-) #4

2.58

INITIAL MOISTURE %

G_s(+) #4DRY DENSITY g/cc
 lb/cu ft

1.53 1.63 1.72

G_m(Bulk)(+) #4

VOID RATIO

.6803 .5853 .5023

TEST SPECIFICATIONS

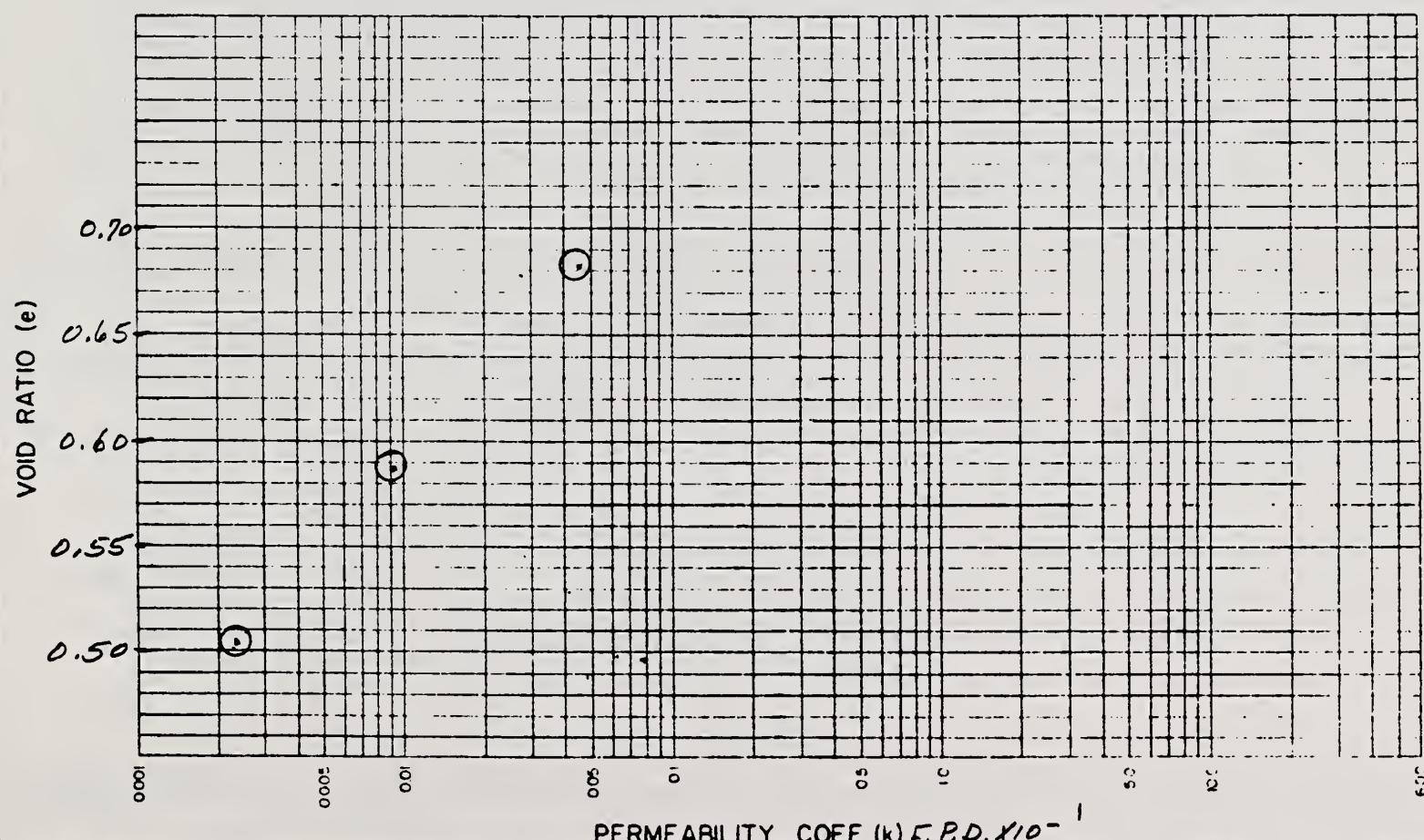
PERMEABILITY COEF F.P.D.

.00466 .00091 .00024

Falling Head Permeability

PERCOLATION COEF

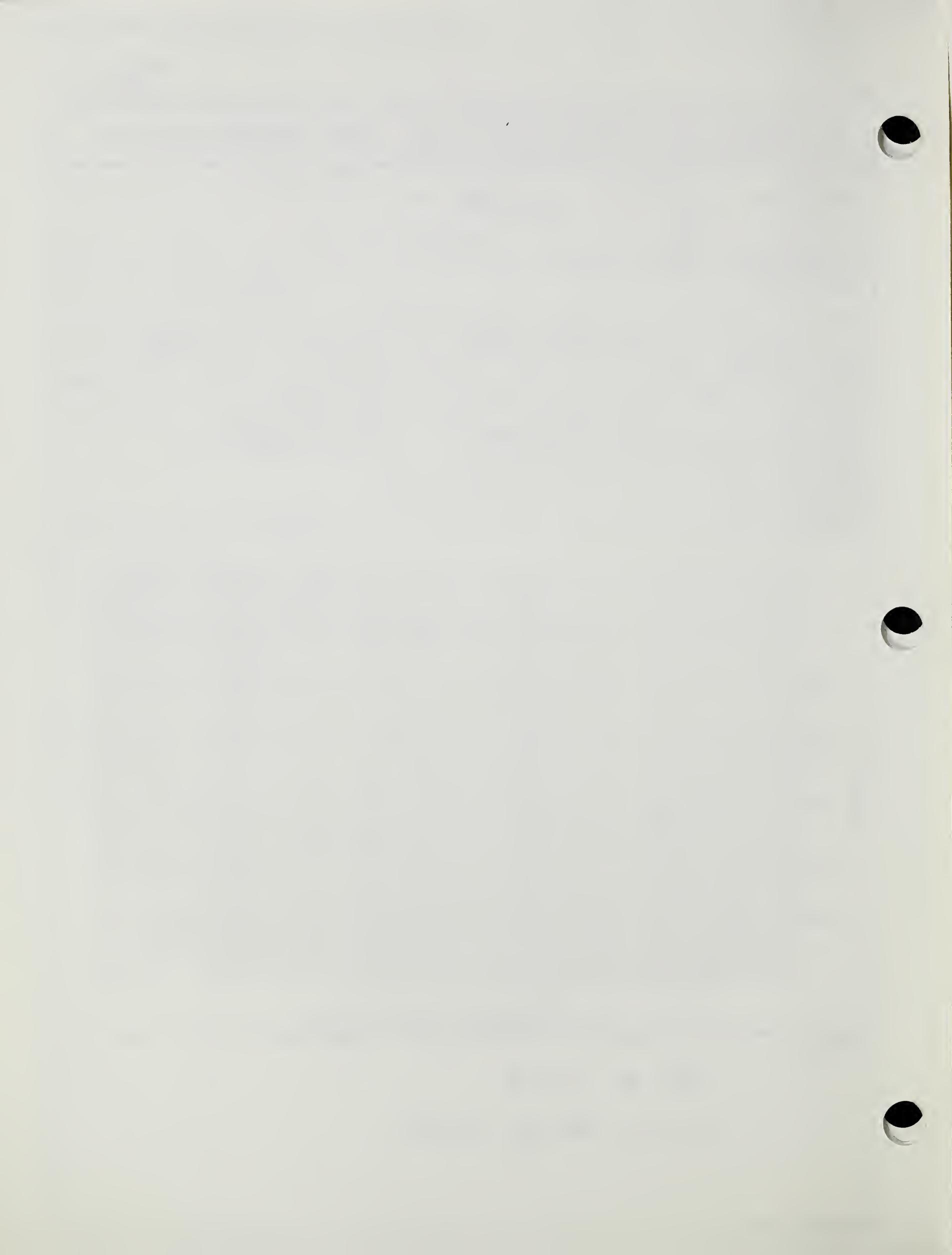
H/L DURING TEST



REMARKS

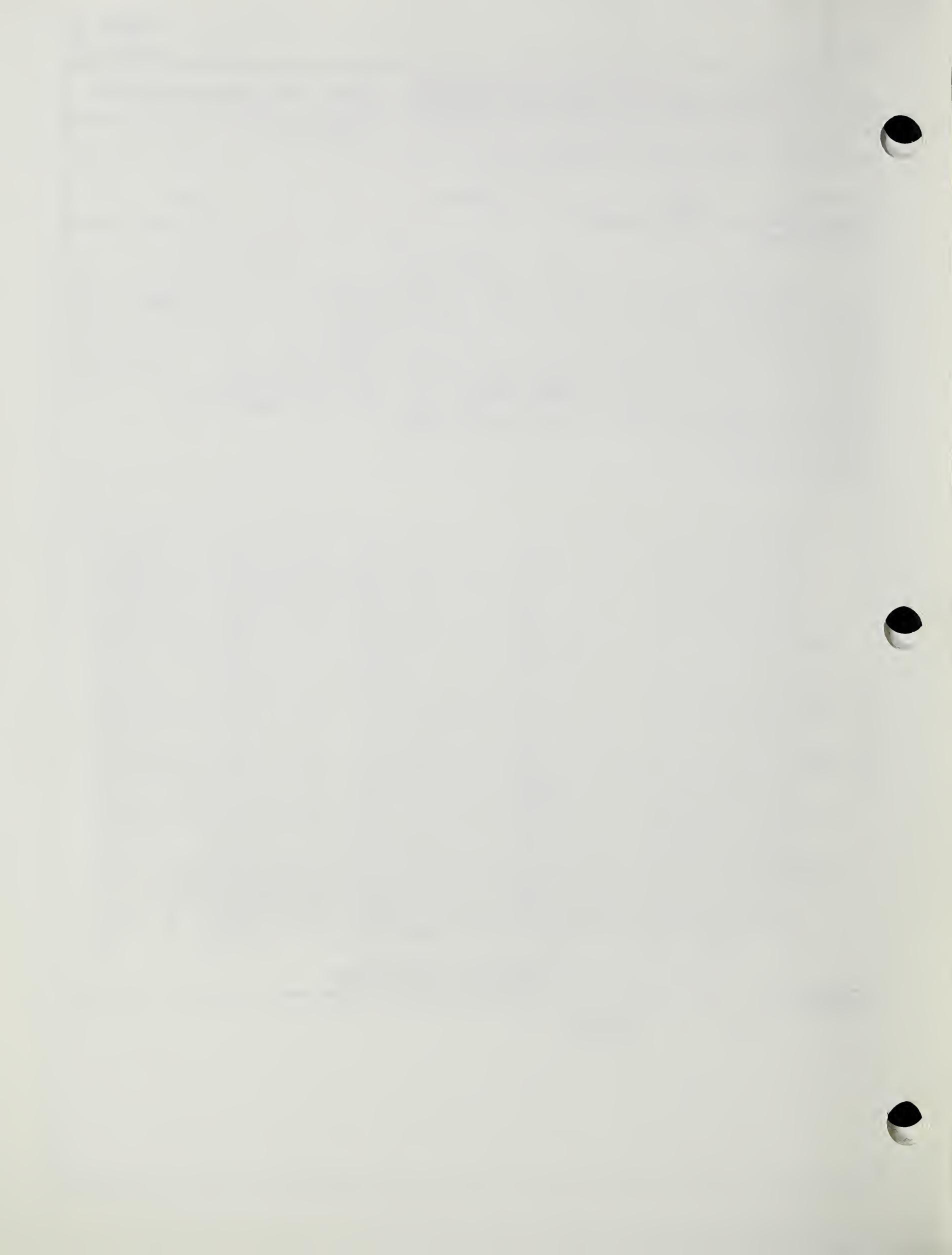
$$e_0 = 1.064$$

Volume Change = 27.2%

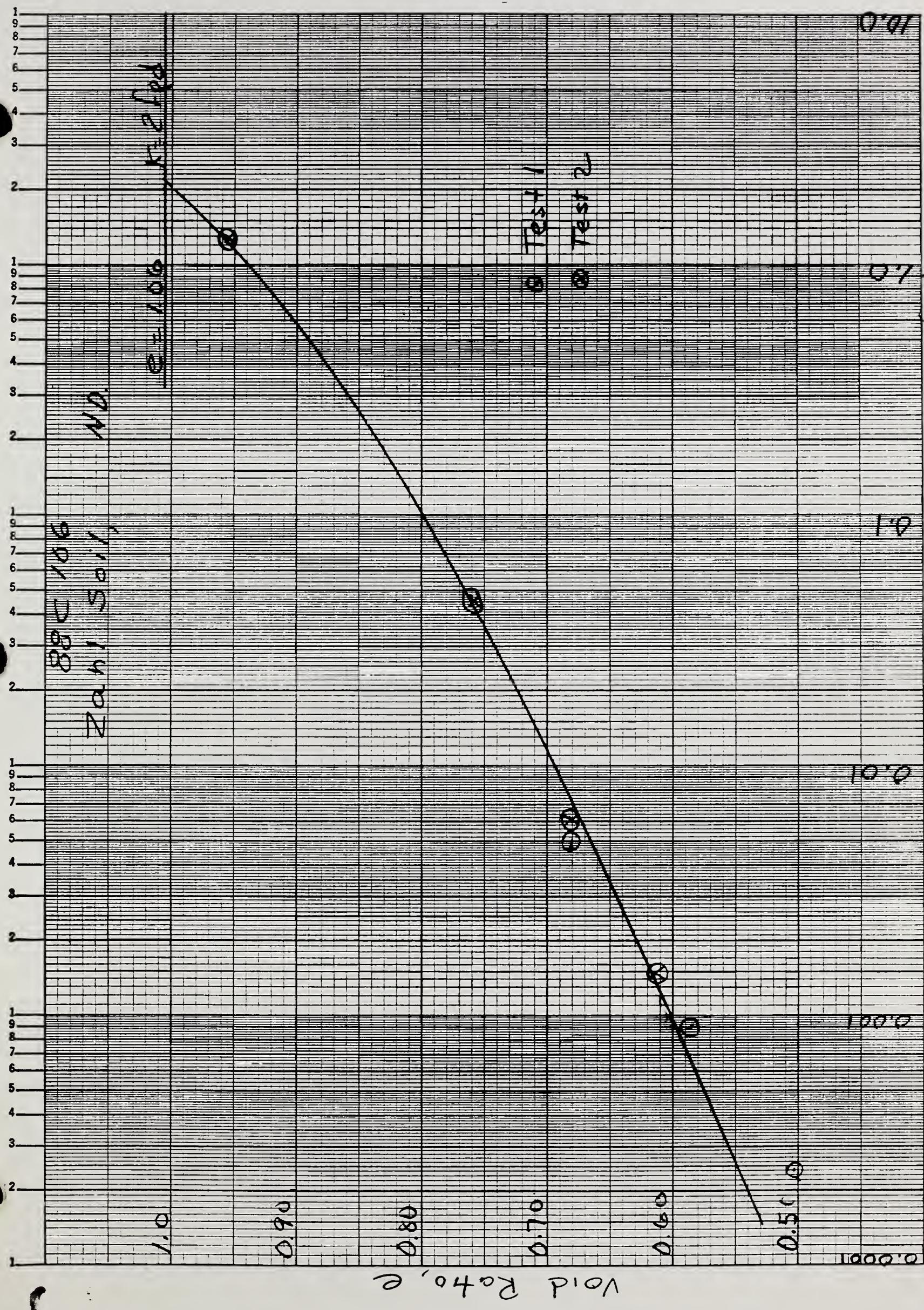


Test 2

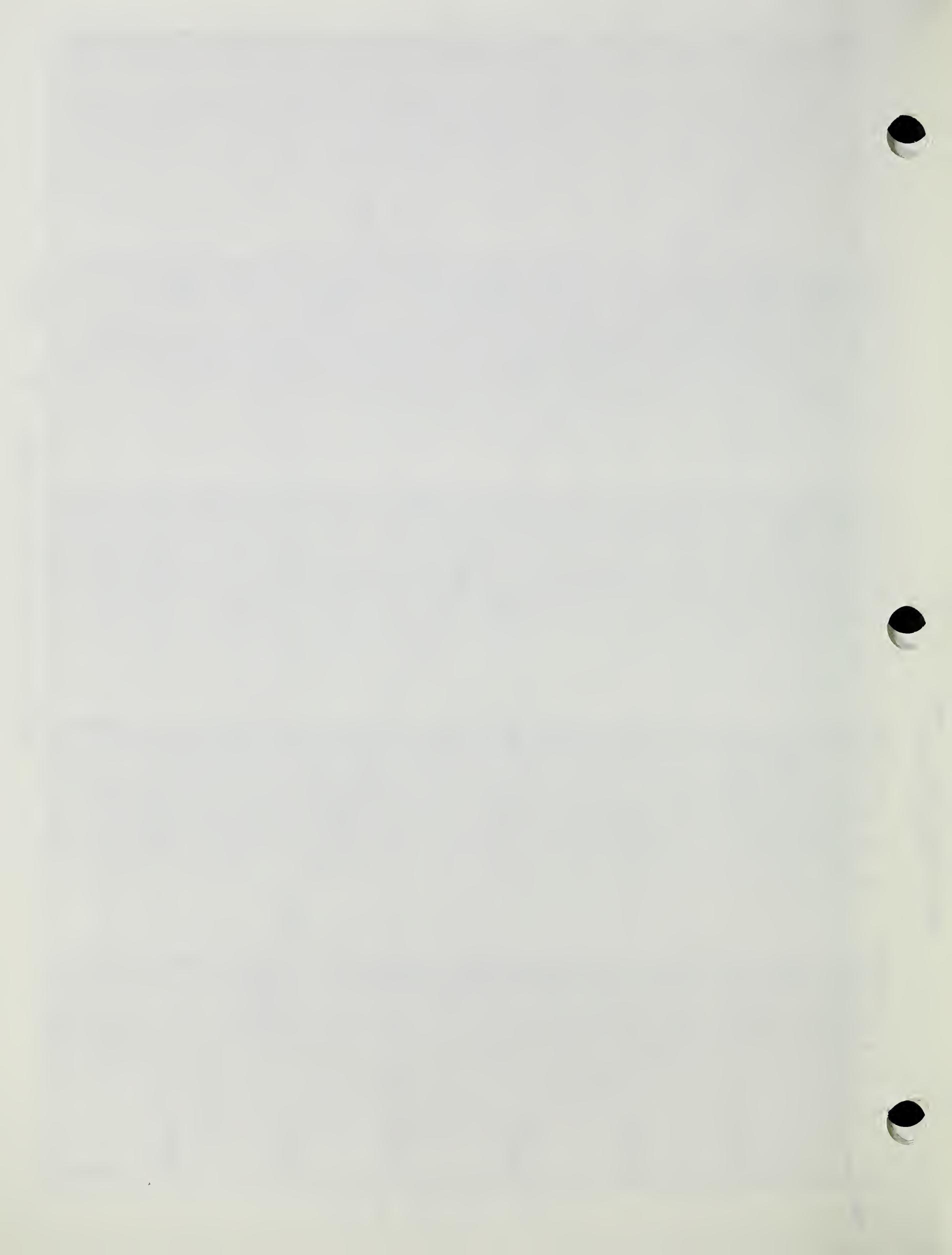
MATERIALS TESTING REPORT		U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE		SOIL PERMEABILITY	
PROJECT AND STATE <i>We PP- Zahl - North Dakota</i>				SAMPLE LOCATION	
FIELD SAMPLE NO.	DEPTH	GEOLOGIC ORIGIN			
TYPE OF SAMPLE <i>Compacted</i>	TESTED AT <i>SML, Lincoln</i>	APPROVED BY		DATE	
CLASSIFICATION <i>CL LL 31 PI 13</i>				SPECIFIC GRAVITY	
TEST NO.	<i>100</i>	<i>500</i>	<i>1000</i>	<i>2000</i>	$G_s (-)^{\#4}$ <i>2.58</i>
INITIAL MOISTURE %					$G_s (+)^{\#4}$
DRY DENSITY <input type="checkbox"/> g/cc <input type="checkbox"/> pcf	<i>1.32</i>	<i>1.47</i>	<i>1.54</i>	<i>1.60</i>	$G_m(\text{Bulk})(+)^{\#4}$
VOID RATIO	<i>.9568</i>	<i>.7582</i>	<i>.6802</i>	<i>.6129</i>	TEST SPECIFICATIONS <i>Falling Head Perm.</i>
PERMEABILITY COEF. F.P.D.	<i>1.2669</i>	<i>.04477</i>	<i>.00608</i>	<i>.00149</i>	
PERCOLATION COEF					
H/L DURING TEST					
<p>Graph showing the relationship between Void Ratio (e) and Permeability Coef. (k) F.P.D. The Y-axis is labeled "VOID RATIO (e)" and ranges from 0.60 to 1.00. The X-axis is labeled "PERMEABILITY COEF. (k) F.P.D." and ranges from 0.00 to 6.00. Three data points are plotted: (0.60, 1.2669), (0.70, 0.04477), and (0.90, 0.00149).</p>					
REMARKS <i>$c_0 = 1.064$</i>					



KOE SEMI-LOGARITHMIC 358-91
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Performance Test Coef. K (fpm)



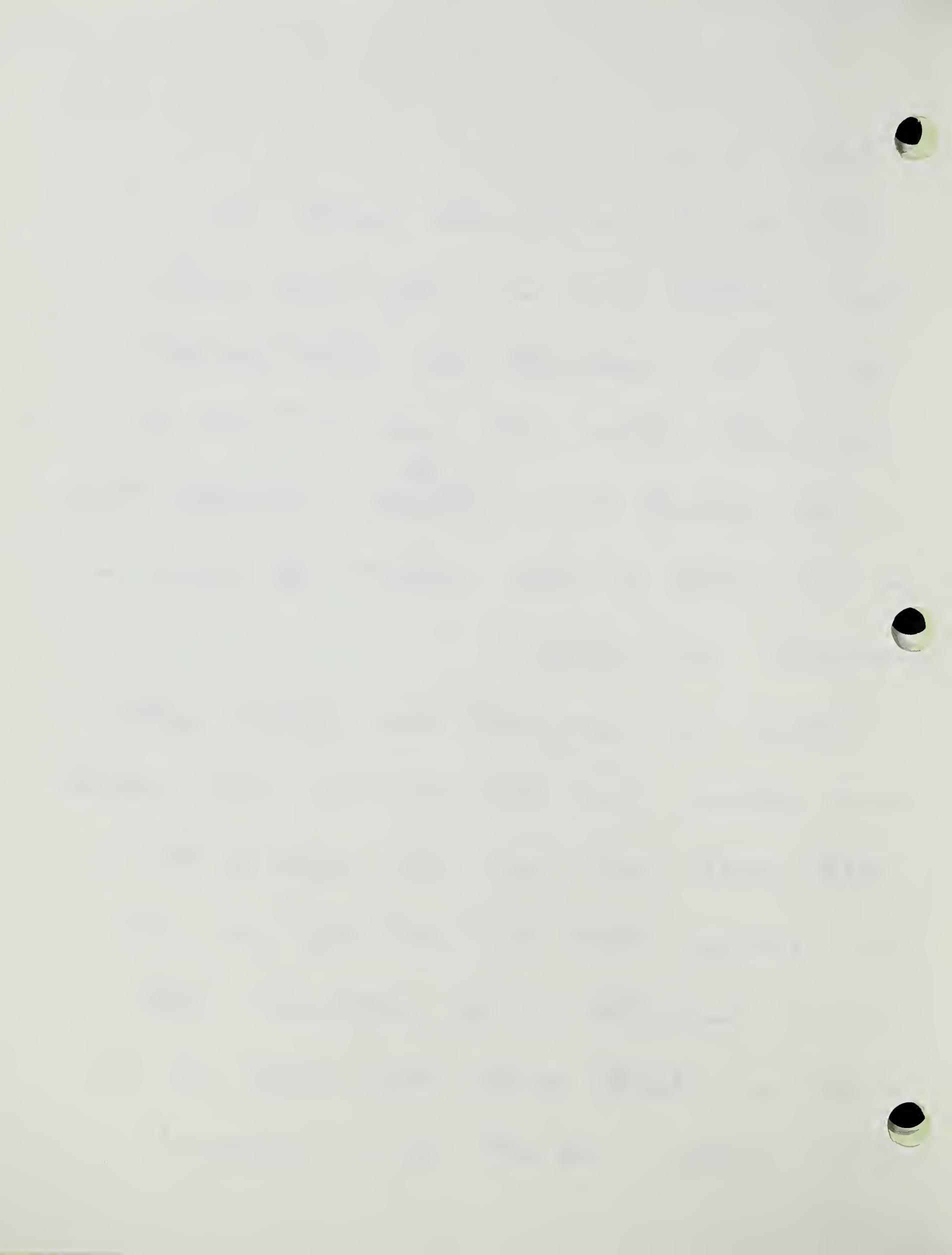
Effect of Conductivity of Eroding Water on Critical Shear Stress



Lorn Dunigan:

Here are the WEPP water samples you
had requested and how they were made
up. We approximated the actual divalent /
monovalent cation ratio with Ca^{++} and Na^+
in the chloride form. ^{The ratio} ~~of water~~ is an important factor
in the ability of these waters to flocculate or
+ coagulate soil colloids.

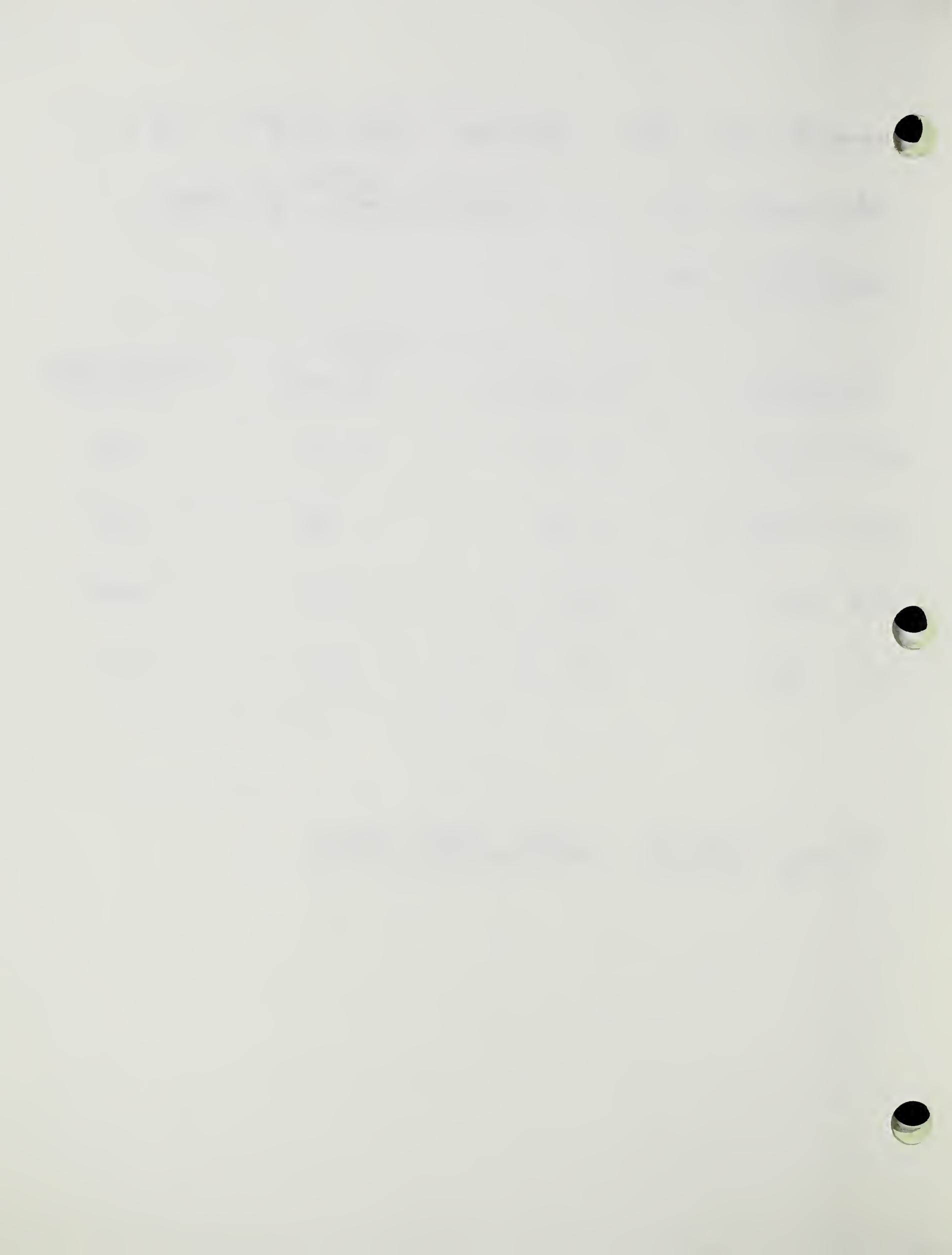
Because we approximated the actual system,
which contains some Mg^{++} and SO_4^- with neutral
salts that don't have the property for
ion-pairing that Mg^{++} and SO_4^- do, the
measured conductivity of the artificial water
samples is slightly greater than that of the
actual water, but not by a significant



amount (see the attached data sheets) . It is
the same for a ~~theoretical~~^{solution} of that
composition however .

<u>Sample #</u>	EC mmhos/cm		
	<u>Theoretical</u>	<u>Actual</u>	<u>original water sample</u>
87T 7455	0.33	0.37	0.28
87T 7458	1.48	1.48	1.02
F7D 4000	0.62	0.62	0.55
87T 7381	3.6	3.7	3.01

Terry Sobeck , Full Spectrum , NSSC .



Barnes 50.1

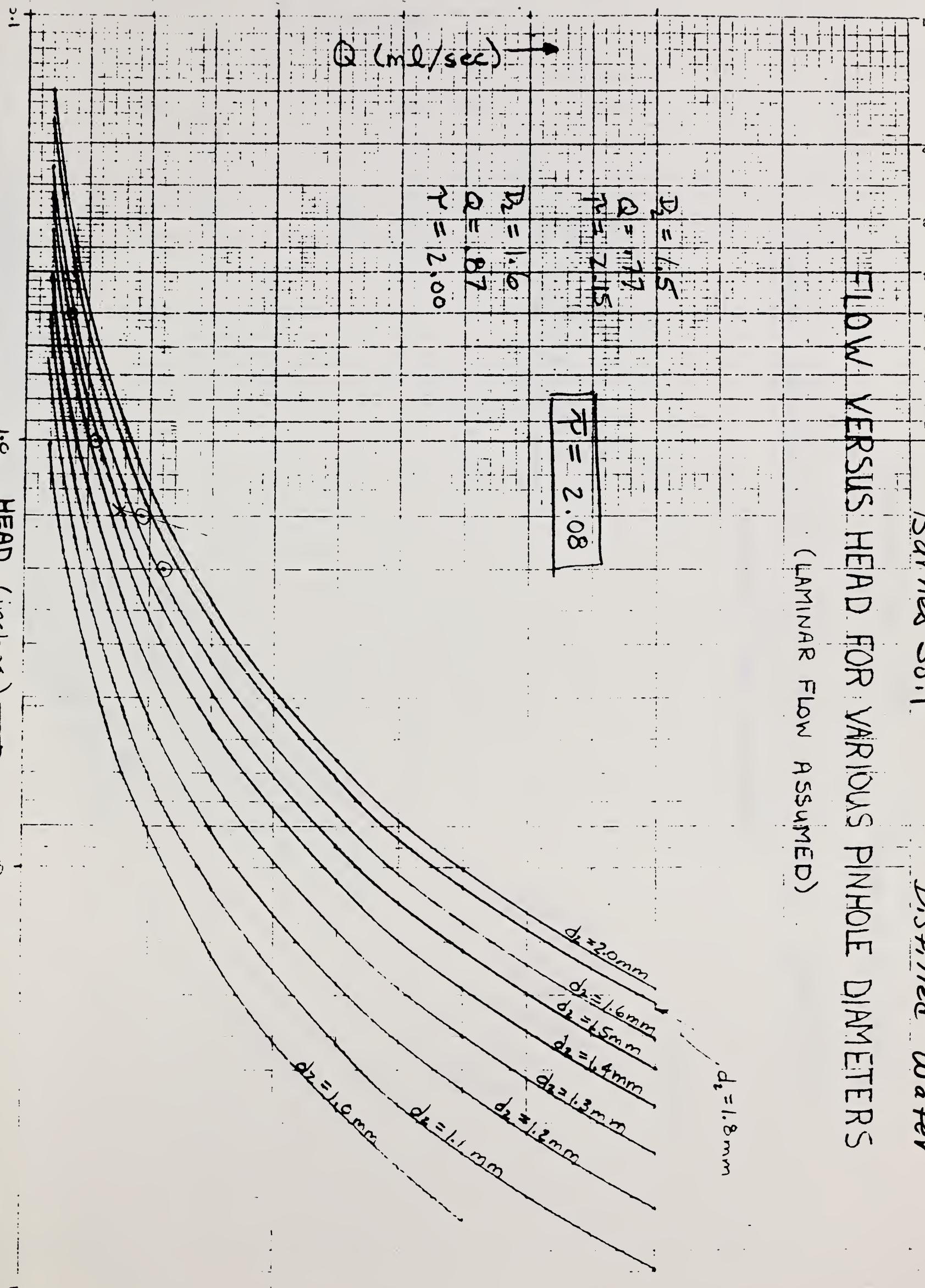
000 74

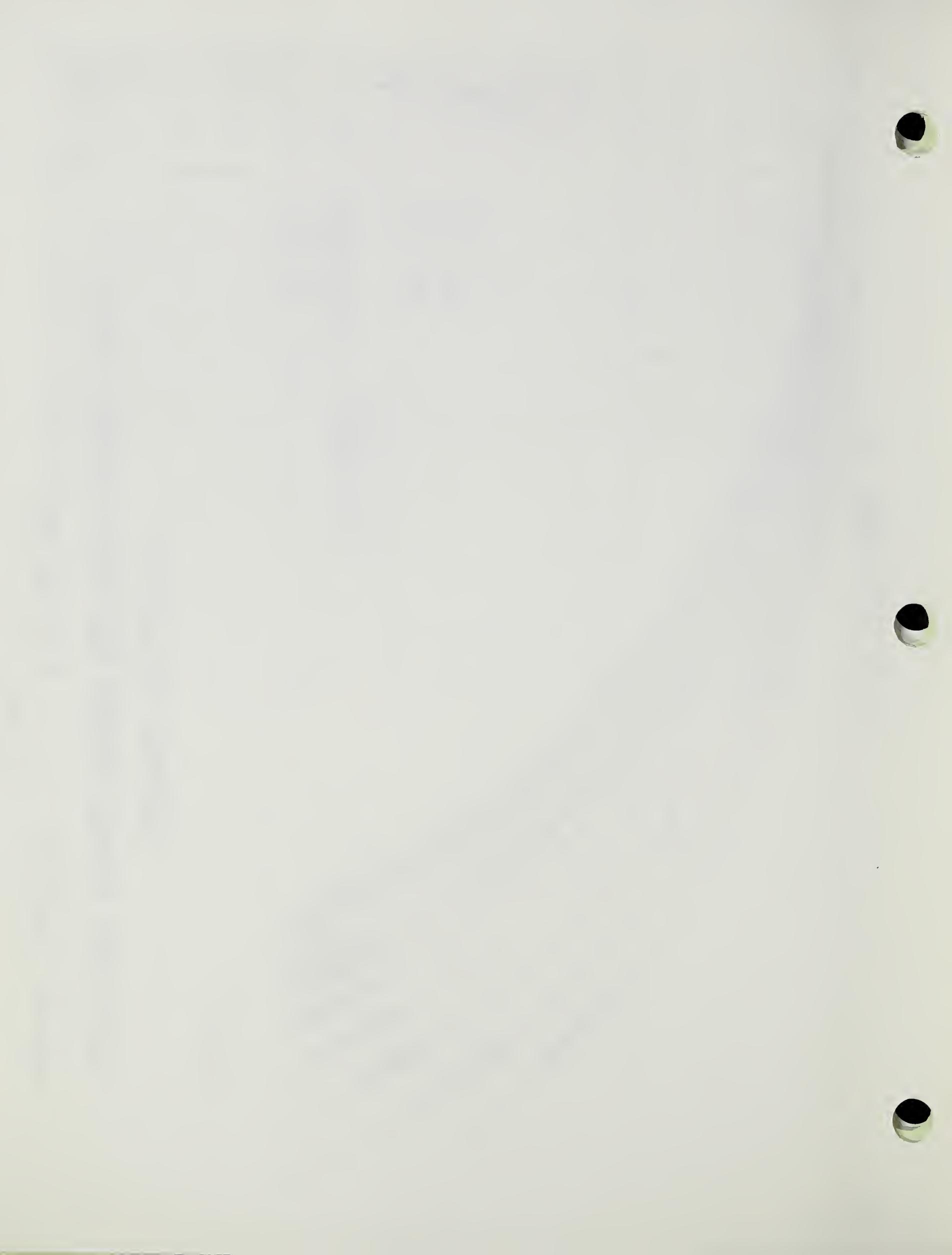
D.5t₁/l²d Water

FLOW VERSUS HEAD FOR VARIOUS PINHOLE DIAMETERS

(LAMINAR FLOW ASSUMED)

1.0 HEAD (inches) —





Barnes Soil ND

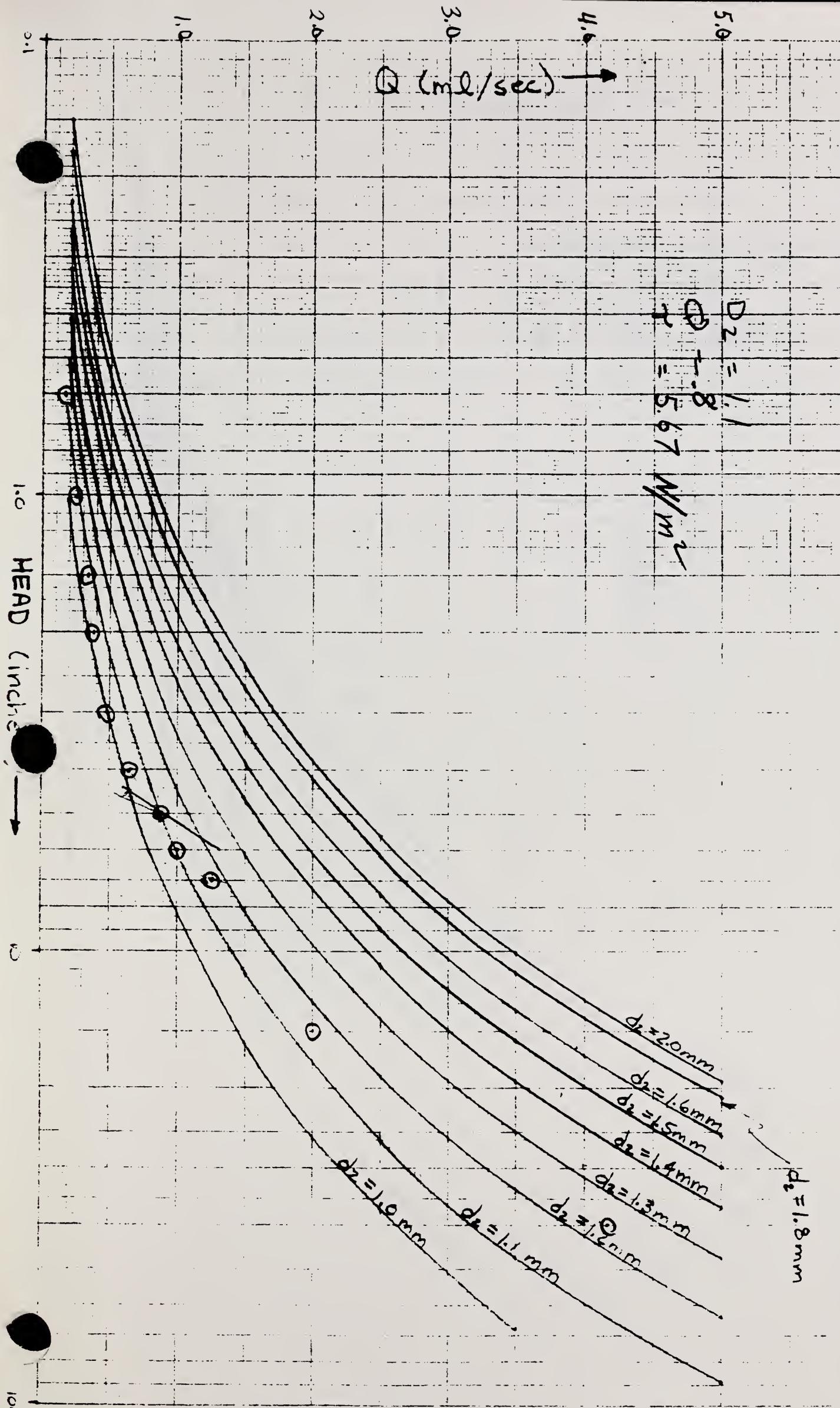
88C 92

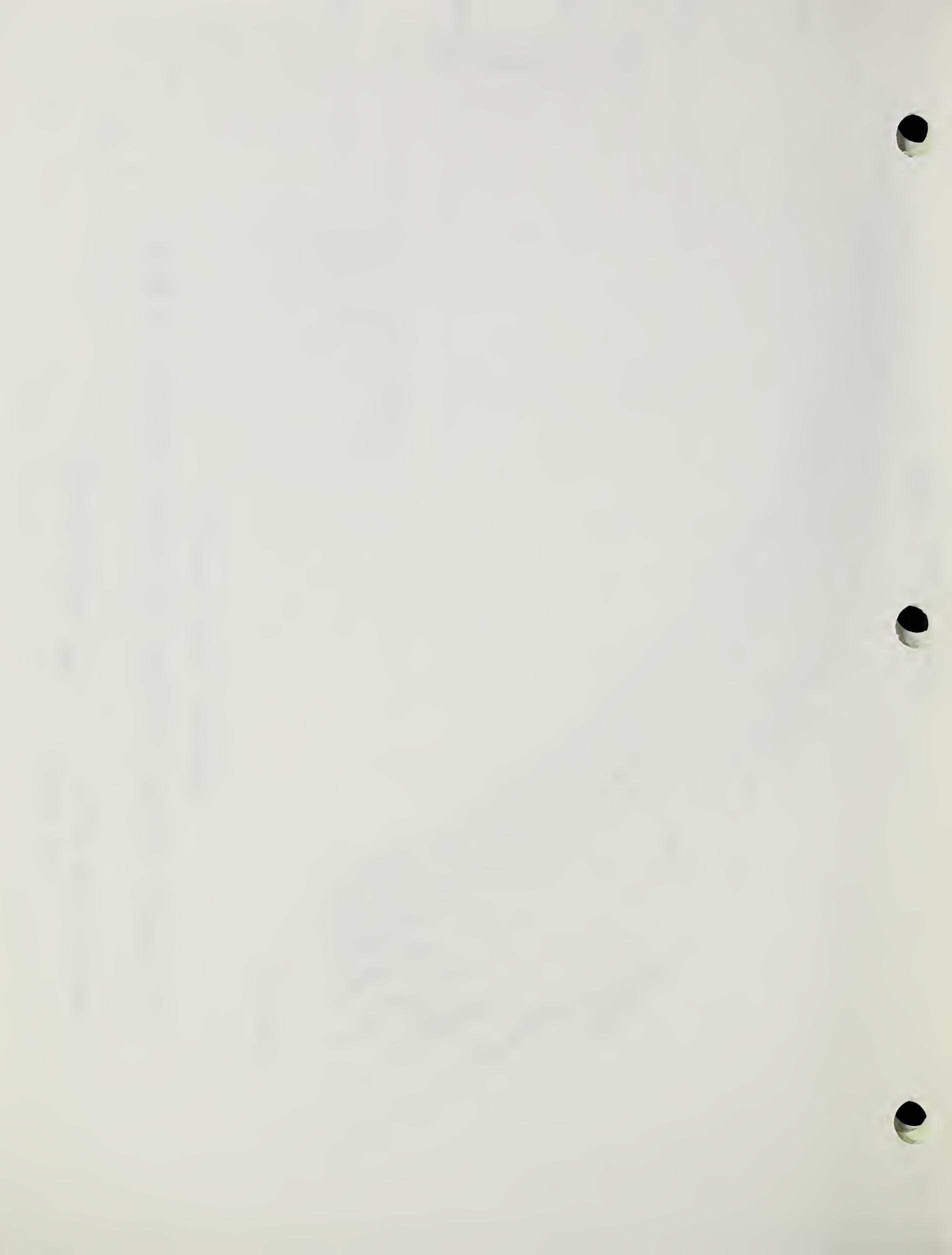
Field Trial Water

FLOW VERSUS HEAD FOR VARIOUS PINHOLE DIAMETERS

(LAMINAR FLOW ASSUMED)

$$Q = \frac{\pi D_2^2}{4} H$$
$$D_2 = 1.8 \text{ mm}$$
$$Q = 5.67 \text{ ml/sec}$$





Keith Soil

88C 45

Distilled Water

FLOW VERSUS HEAD FOR VARIOUS PINHOLE DIAMETERS

(LAMINAR FLOW ASSUMED)

$$d_2 = 1.8 \text{ mm}$$

$$D_2 = 2.0$$

$$Q = .5$$

$$Q = .59$$

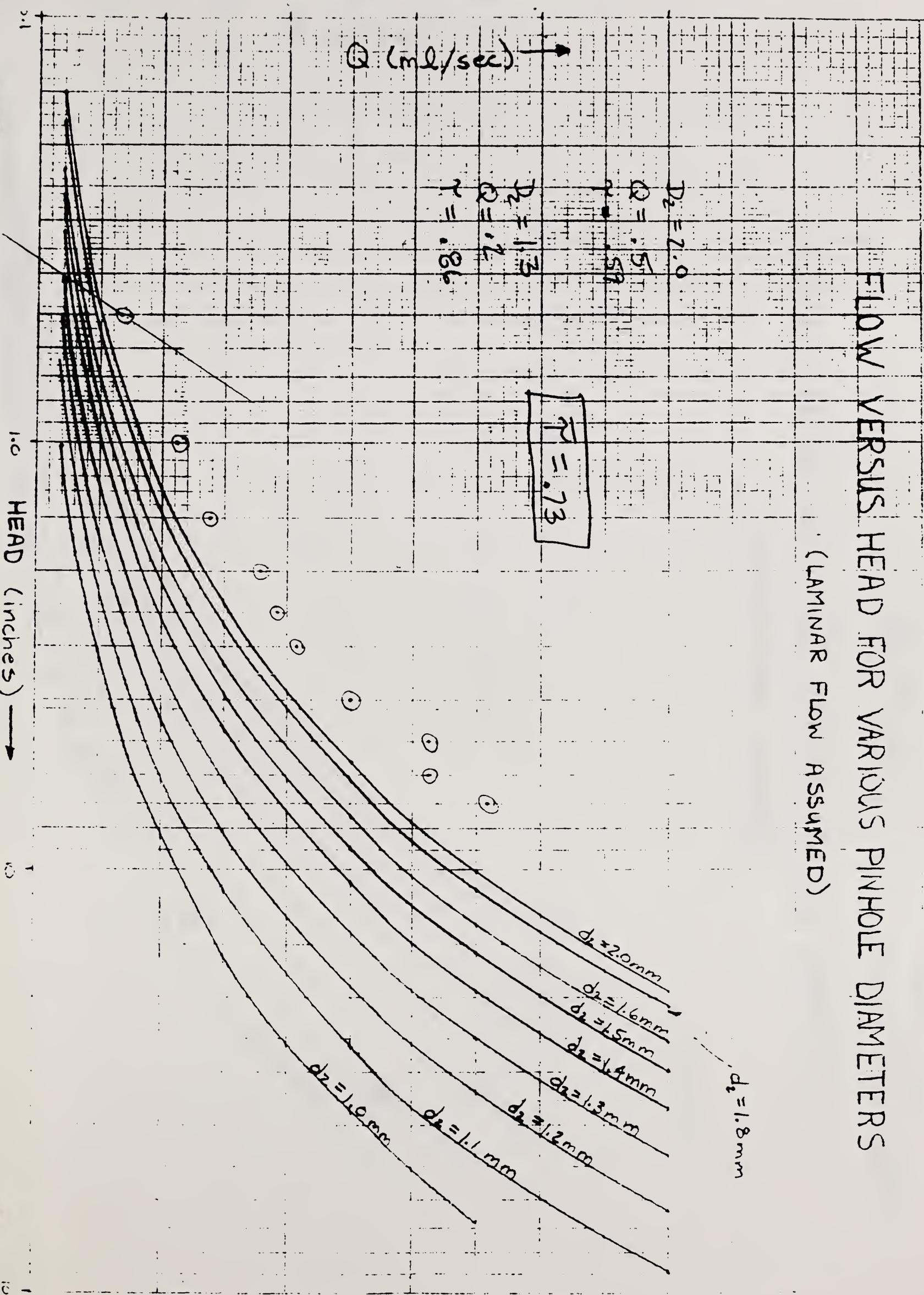
$$r = .73$$

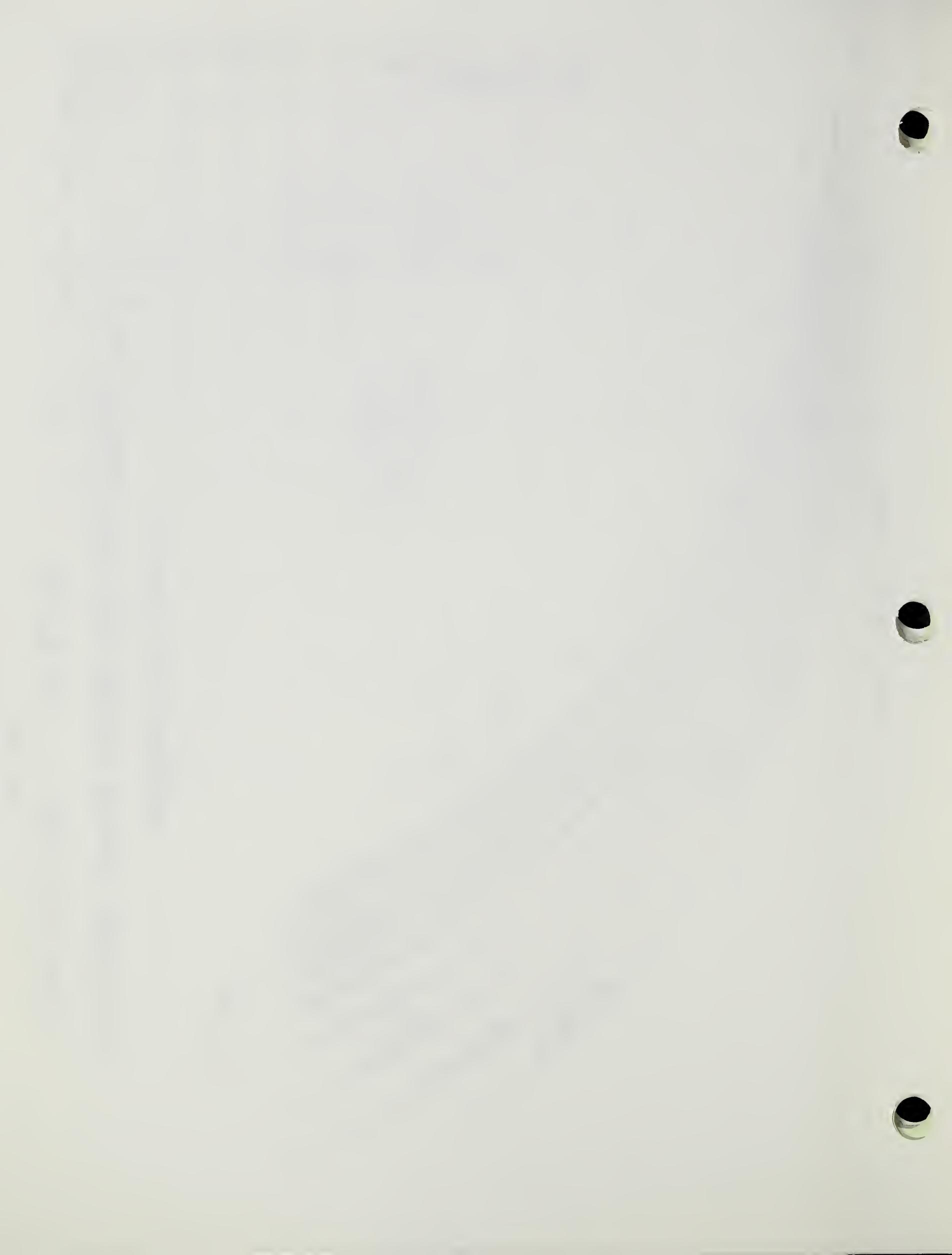
$$D_2 = 1.3$$

$$Q = .2$$

$$r = .86$$

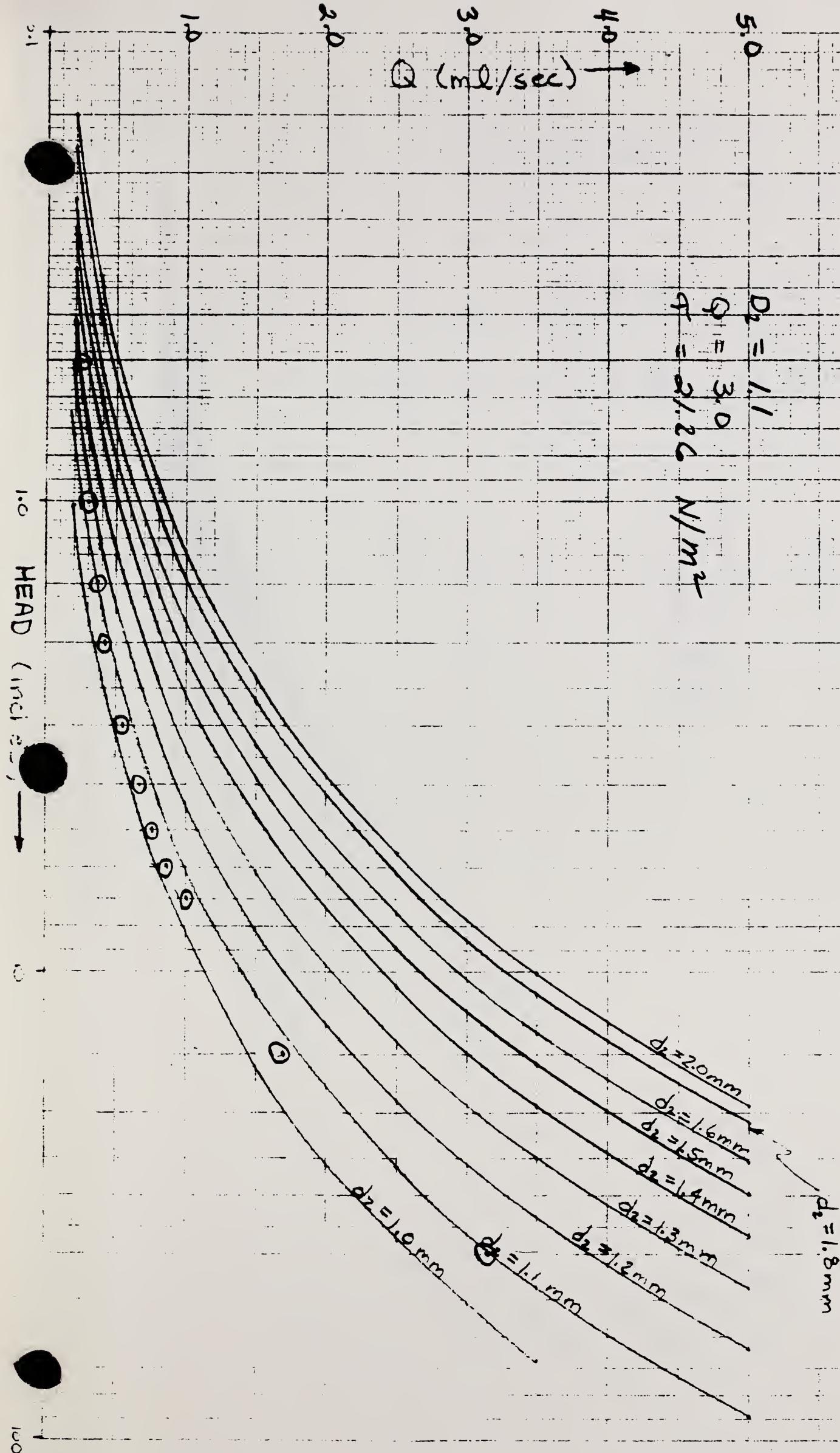
$$Q (\text{cm}^3/\text{sec})$$

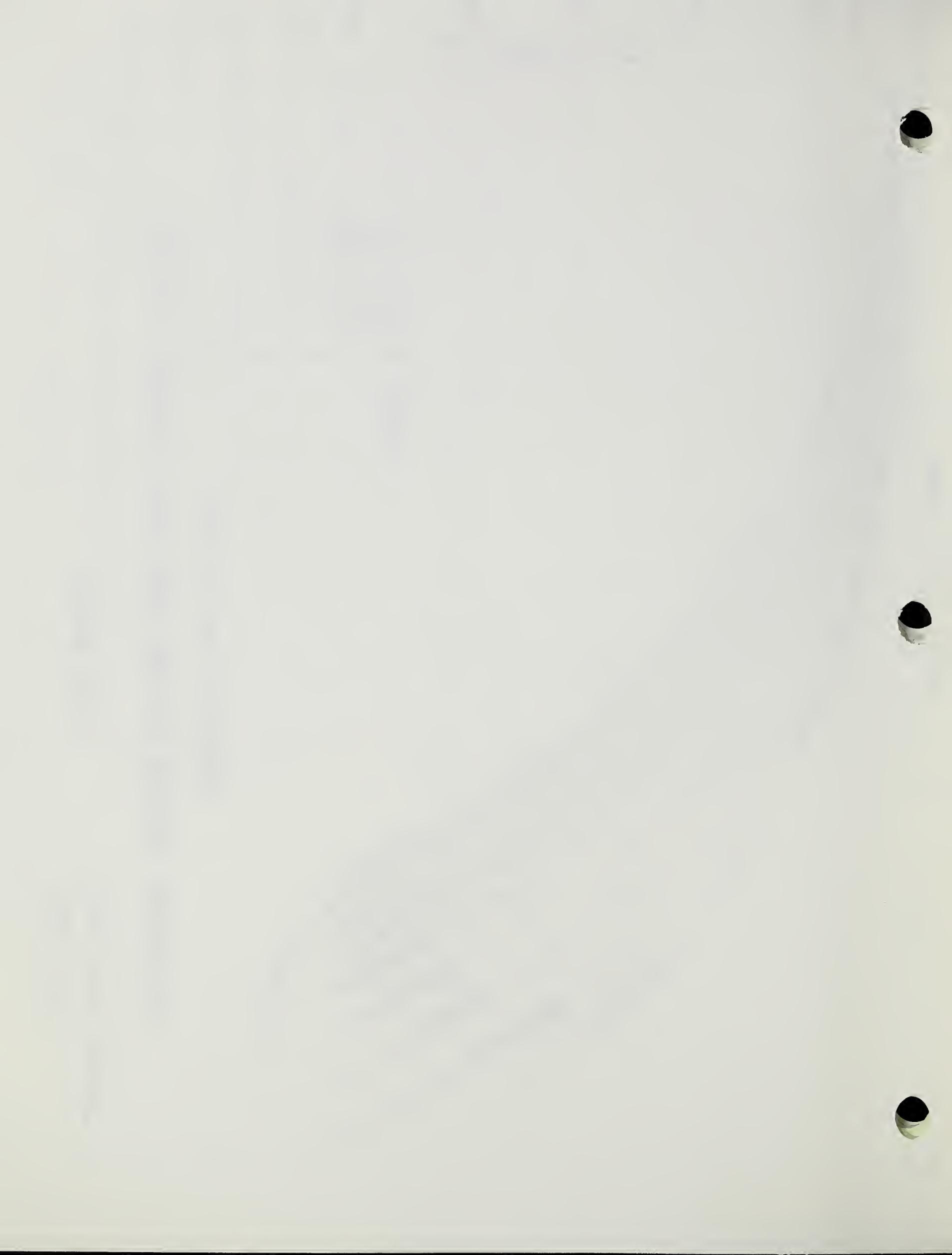




Keith Soil
Field Trial Water
88C 95

FLOW VERSUS HEAD FOR VARIOUS PINHOLE DIAMETERS
(LAMINAR FLOW ASSUMED)





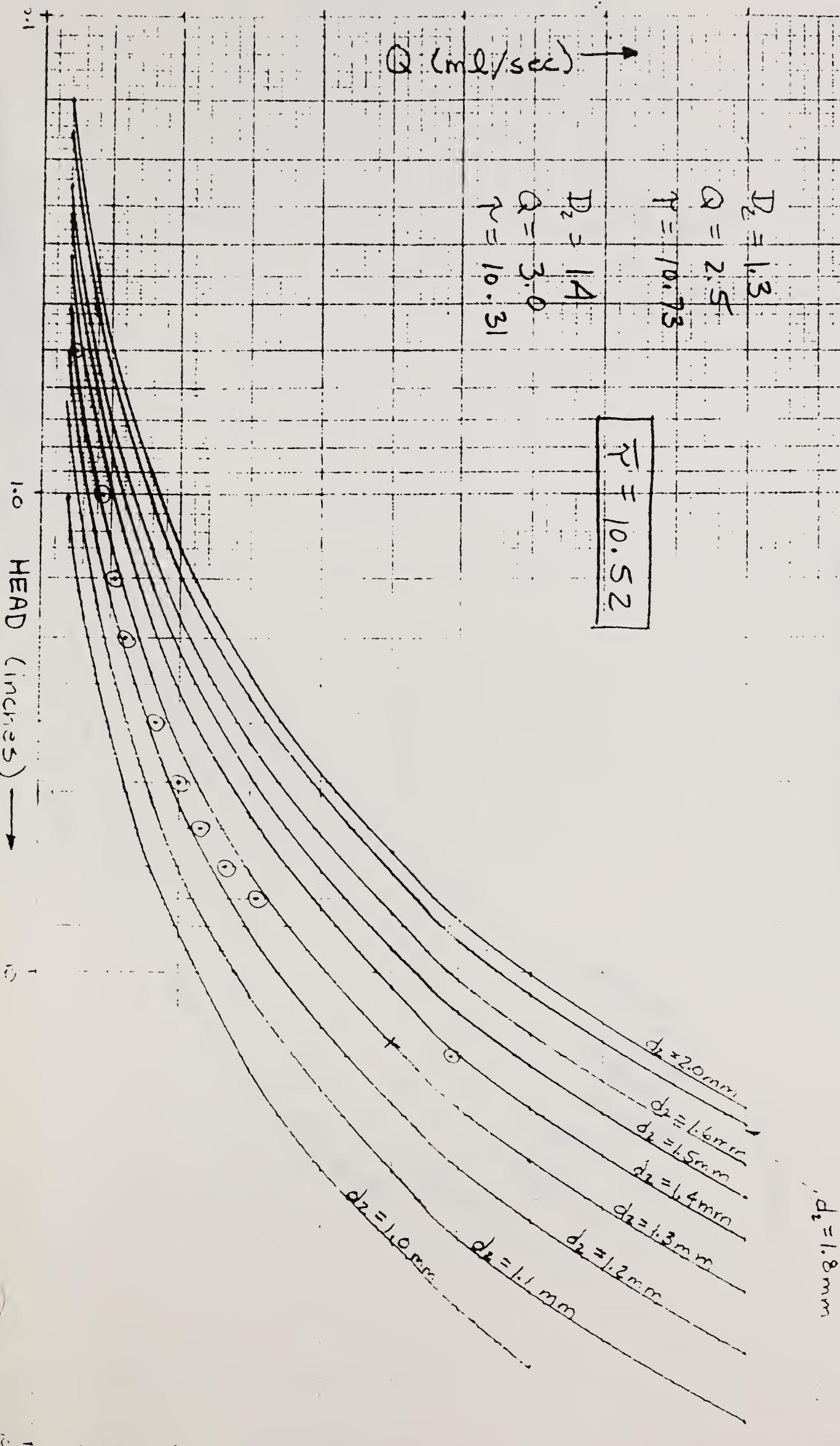
Los Banos Soil

68C

Distilled Water

FLOW VERSUS HEAD FOR VARIOUS PINHOLE DIAMETERS

(LAMINAR FLOW ASSUMED)

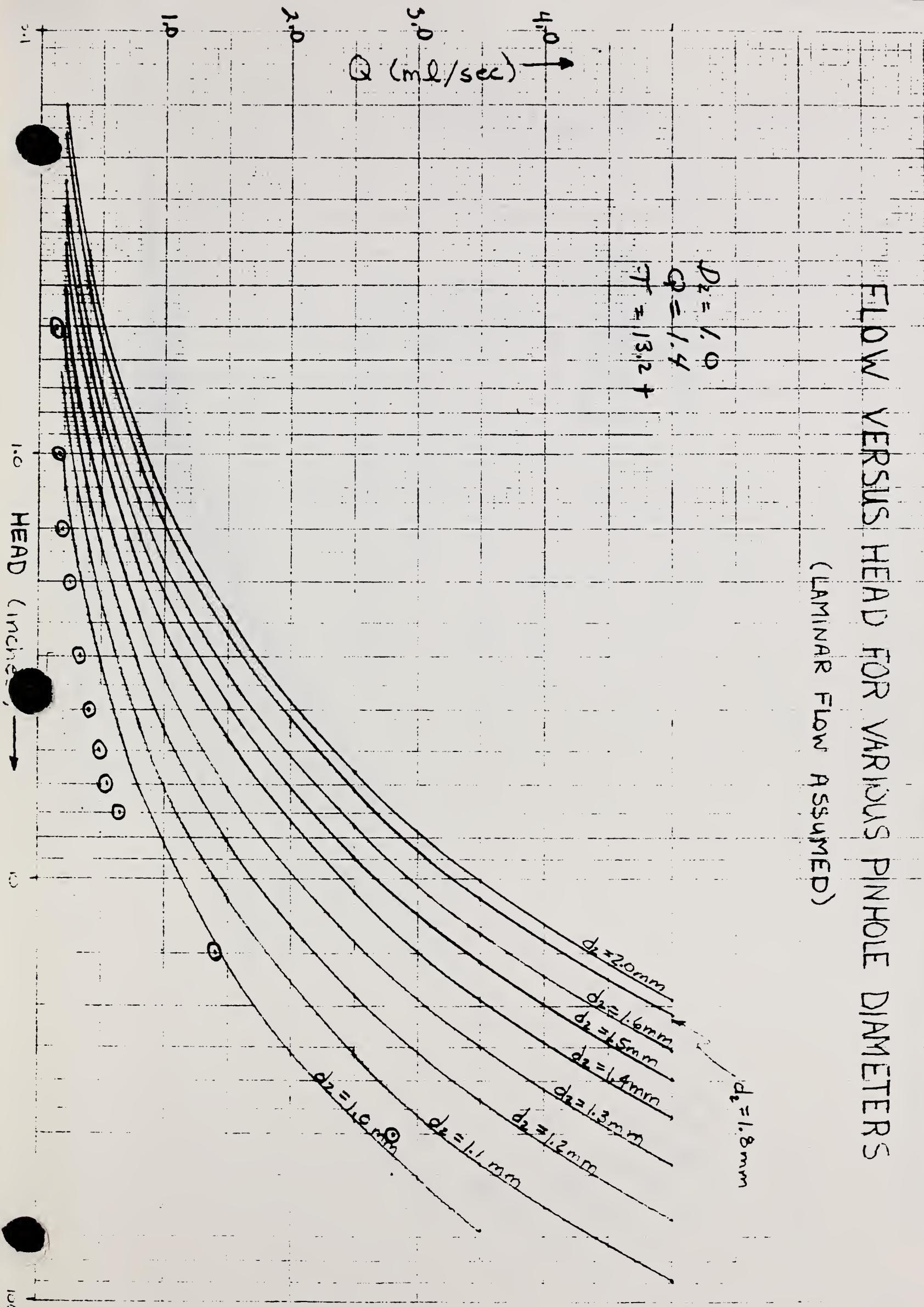


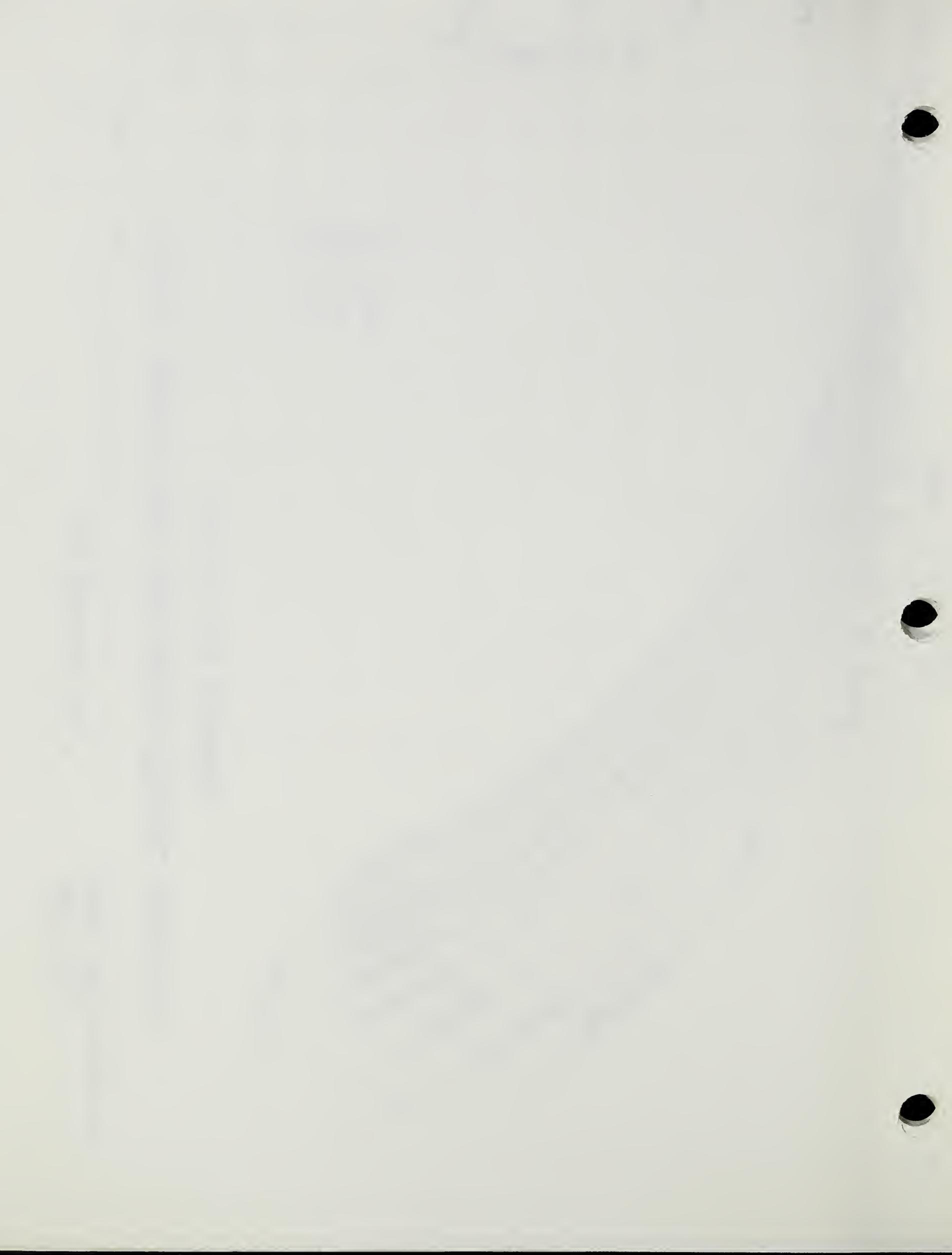


Los Banos Soil

88C 96
Field Trial Water

FLOW VERSUS HEAD FOR VARIOUS PINHOLE DIAMETERS
(LAMINAR FLOW ASSUMED)

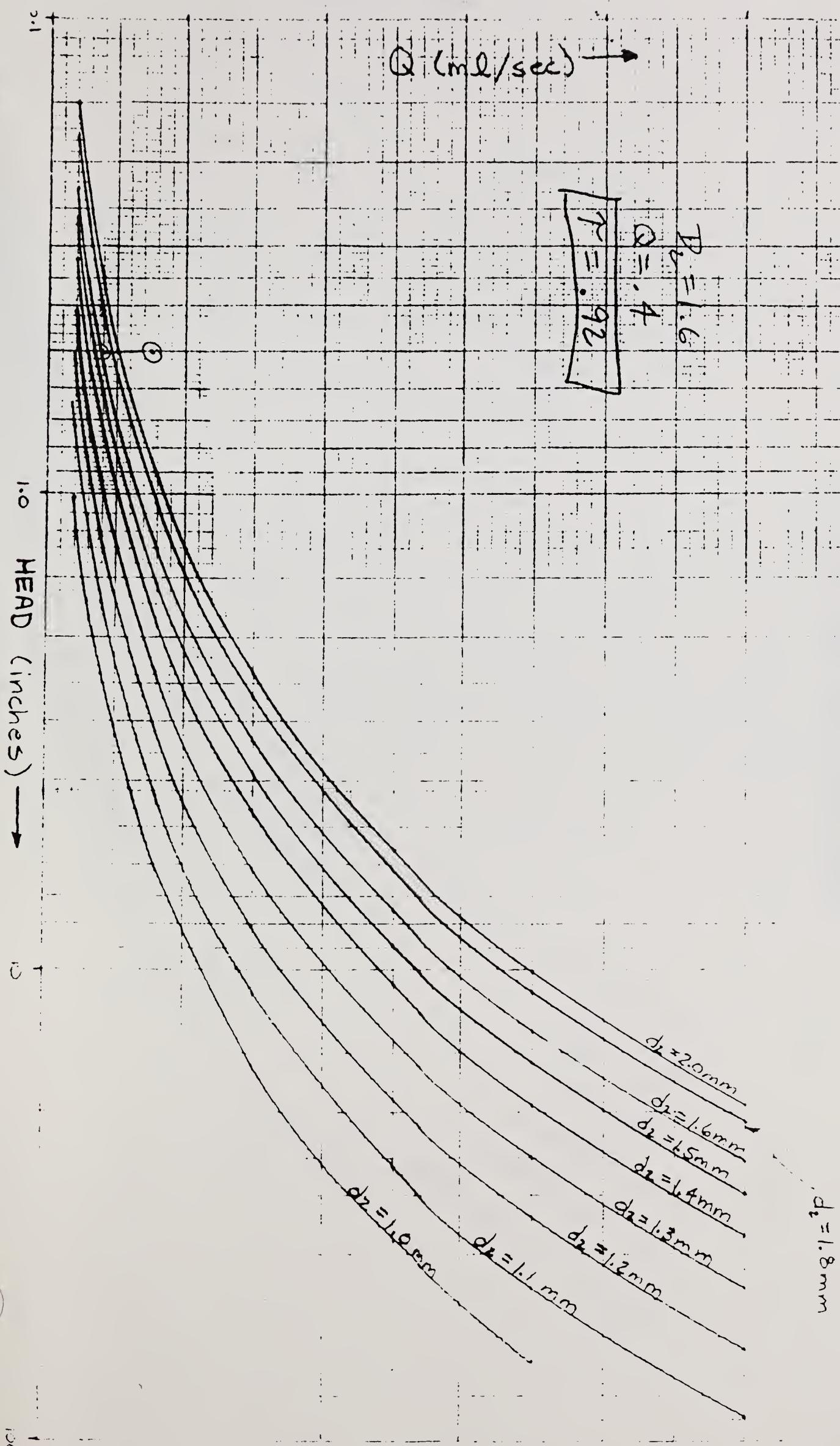


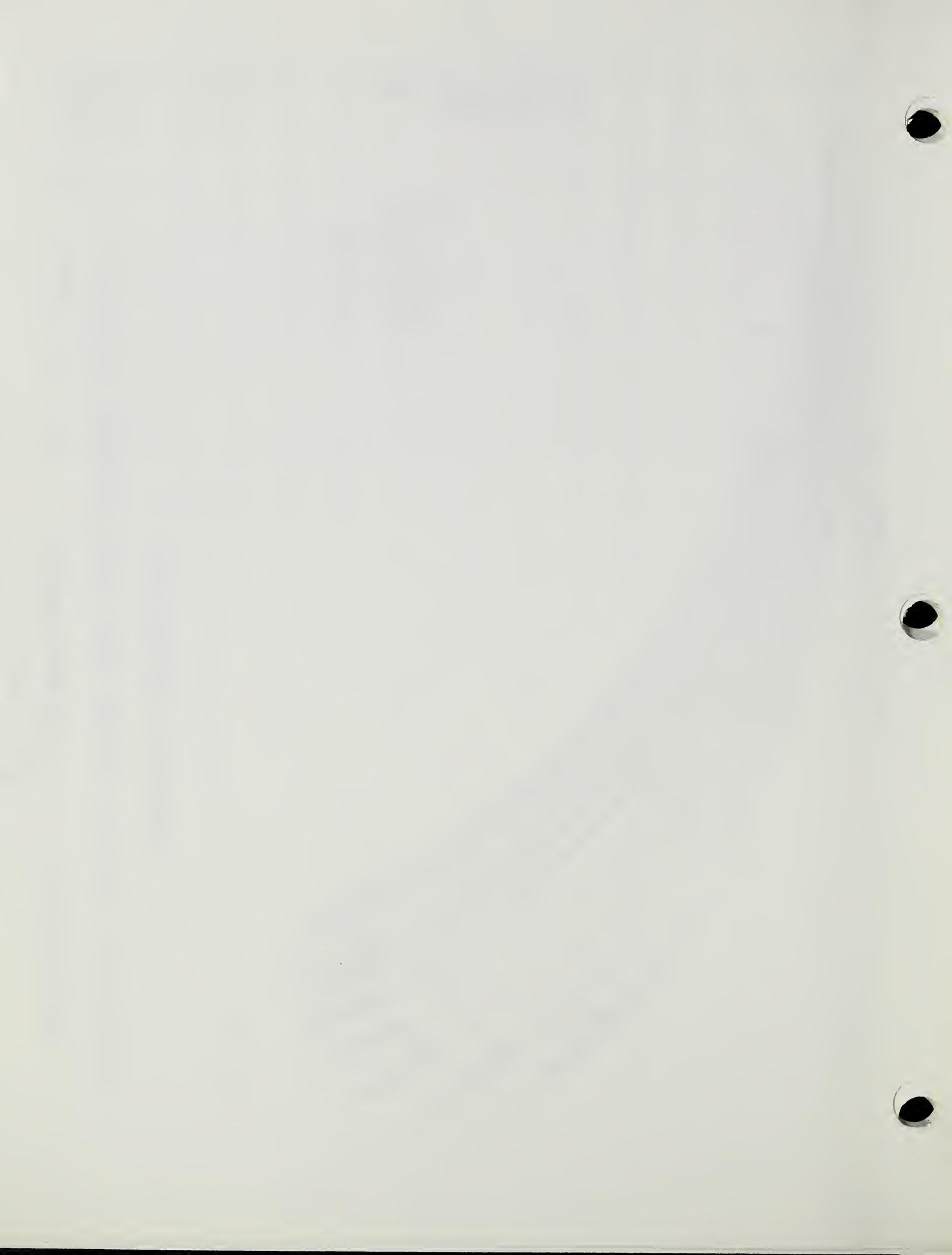


88C 105

Woodward So. I Distilled Water

FLOW VERSUS HEAD FOR VARIOUS PINHOLE DIAMETERS
(LAMINAR FLOW ASSUMED)





Woodward Soil

88C105
Field Trial Water

FLOW VERSUS HEAD FOR VARIOUS PINHOLE DIAMETERS
(LAMINAR FLOW ASSUMED)

