

VOGTLE ELECTRIC GENERATING PLANT

REPORT ON CONFIRMATORY LABORATORY TESTING
PROGRAM FOR CATEGORY 1 BACKFILL

PREPARED FOR SOUTHERN COMPANY SERVICES
AND
GEORGIA POWER COMPANY
BY
BECHTEL CIVIL AND MINERALS, INC., NORWALK

SEPTEMBER 1984

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VOGTLE ELECTRIC GENERATING PLANT
UNITS 1 & 2
CONFIRMATORY LABORATORY TESTING PROGRAM
FOR CATEGORY 1 BACKFILL

1.0 INTRODUCTION

At the request of the Nuclear Regulatory Commission (NRC), a laboratory testing program of Category 1 backfill was developed by Bechtel and Southern Company Services (SCS). The purpose of the testing program was to verify the typical maximum dry densities which have been determined throughout the backfilling process by Georgia Power Company (GPC), and used to determine the degree of compaction achieved in the field. This was determined by having both Georgia Power Company and an independent laboratory perform maximum dry density tests (ASTM 1557) on split samples. Additional testing was to be performed by the independent laboratory. Law Engineering Testing Company (LETCO) was selected by the NRC to implement the confirmatory laboratory testing program.

A total of 12 samples of representative Category 1 backfill material were tested by LETCO and GPC. Data developed by LETCO and GPC are attached to this report as Appendices 1 and 2 respectively. A discussion of the data generated by the two laboratories follows.

2.0 SAMPLING

Sampling of the backfill material was done by GPC. Seven of the twelve samples were obtained directly from borrow sources; the other five were obtained in a manner that was consistent with the normal handling of the fill in the field. Each sample weighed approximately 100 lbs and was obtained in the following manner.

First a large bulk sample of approximately 400 lbs was obtained from the borrow source or the fill. Each large bulk sample obtained from the borrow source was thoroughly mixed and then subdivided into 4 - 100 lb test samples. Large bulk samples obtained from the fill were not mixed prior to splitting them. Of the 4 - 100 lb test samples, one was shipped to LETCO and the other three were retained by GPC. Of the retained samples, one was used for testing by GPC and the others were stored for record purposes. Prior to shipping, testing and storing samples, testing in accordance with ASTM D1140 was performed by GPC on material obtained from each 100 lb sample. The purpose of the ASTM D 1140 testing was to determine percent passing the US No. 200 sieve size and thus help GPC establish whether the samples selected for testing met the criteria for soil types defined in the testing program. The above procedure of obtaining and selecting samples was followed for all twelve test samples. The testing program developed by Bechtel and SCS called for selection of 6 samples with fines of less than 5 percent and 4 samples each with fines ranging from 5 to 9 percent and 9 to 12 percent respectively. However because of sampling difficulties encountered in the field, only two samples in the 5 to 9 percent range of fines could be obtained. This was due to the unavailability of this range of materials in the borrow sources. Therefore a total of 12 samples were tested instead of 14 as originally planned.

3.0 LABORATORY TESTING

Both LETCO and GPC's field soils laboratory performed the modified Procter (ASTM D 1557) and sieve analysis (ASTM D 422) tests on the twelve soil samples. LETCO also performed the soil tests listed below as required by the testing program. These tests were not performed by GPC as their field laboratory was not equipped to perform them.

<u>No.</u>	<u>Type of Test</u>	<u>Test Standard</u>
1	Hydrometer Analysis	ASTM D 422
2	Relative Density of Cohesionless Soils	ASTM D 4253-83 & D 4254-83 (New Standards issued in 1983)
3	Permeability of Soils	US Army Corps. of Engineers, EM-1110-2-1906 Appendix VII
4	Liquid Limit of Soils	ASTM D 423
5.	Plastic Limit of Soils	ASTM D 424

Description of testing procedures used is given in LETCO's report (Appendix 1)

4.0 EVALUATION

4.1 Maximum Dry Density

Maximum dry densities obtained by LETCO and GPC from the modified Proctor test (ASTM D 1557) are summarized in Table 1. The data in Table 1 show that for material with less than 5 percent fines, LETCO's maximum dry densities ranged from 103.3 to 108.2 pcf and GPC's ranged from 101.9 to 104.7 pcf. LETCO's maximum dry densities are higher than those obtained by GPC and the difference ranges from 0.8 to 3.5 pcf with an average of 2.0 pcf. When expressed as a percentage of the mean of the maximum dry densities for each sample obtained from the two laboratories, the differences range from 0.8 to 3.3 percent. This is less than the maximum limit of 4 percent specified for multilaboratory precision in Table 3 of the ASTM D 1557 test standard. Therefore the test results of both laboratories are considered to be in agreement.

A similar trend is apparent for material ranging in fines from 5 to 12 percent. For this type of material, LETCO's maximum dry density ranged from 107.8 to 115.3 pcf and GPC's ranged from 106.8 to 114.2 pcf. LETCO's dry densities exceed those obtained by GPC. The difference in dry density ranges from 1.0 to 3.2 pcf with an average value of 1.7 pcf. When expressed as a percentage of mean value, the differences range from 0.9 to 2.9 percent which is less than the maximum limit of 4.0 percent for multilaboratory precision. Again, the test results of both laboratories are considered to be in agreement.

A comparison of the maximum dry densities obtained by ASTM D 1557 with those obtained by ASTM D 4253-83 is presented in Table 2. These data show that for material with less than 5 percent fines, the ASTM D 4253 dry method generally yields higher maximum dry densities than the ASTM D 4253-83 wet method and the ASTM D 1557 test. The ASTM D 4253-83 dry method values exceed GPC's ASTM D 1557 values by 2.4 to 4.3 pcf. While the ASTM D 4253-83 dry method maximum densities are consistently higher than those yielded by ASTM D 1557, the ASTM D 4253-83 wet method shows no such trend. However for material with fines ranging from 5 to 12 percent, ASTM D 1557 yielded higher maximum dry densities than the ASTM D4253-83 wet and dry methods.

The data shown in Tables 1 and 2 indicate the following:

1. As expected, maximum dry density increases with increasing percent passing the No. 200 sieve size. This trend is evident in the data generated by both laboratories.
2. Maximum dry densities obtained by LETCO using the ASTM D 1557 test exceed those obtained by GPC by an average of approximately 2.0 pcf. One possible cause for this difference may be the fact that GPC employs an automatic rammer as compared to a manually operated rammer used by LETCO. However the differences for all samples tested are well within the 4 percent maximum precision limit specified in the ASTM D 1557 test standard. The higher LETCO densities when applied to the compaction test records would not significantly reduce the percent compaction reported by GPC. Therefore the conclusion that the fill meets the specification based on the compaction records remains unchanged.
3. For material with fines ranging from 5 to 12 percent, the ASTM D 1557 test standard currently used by GPC yields densities higher than the relative density test. For materials with less than 5% fines the ASTM D 4253-83 (dry method) yields higher maximum dry densities than the D 1557 test. However the differences in maximum unit weights between the two types of tests are less than an average of about 4 pcf and the fill would meet the specified compaction if the higher maximum unit weight were used.

4.2 Moisture Content

Review of the Optimum Moisture Content (OMC) data shown in Table 1 indicates the following:

1. For material with fines ranging from 5 to 12 percent the agreement between the LETCO and GPC optimum values is within the precision limits of ASTM D 1557, with the exception of samples S-7 and S-10. In the case of sample S-10, the compaction curves prepared by the two laboratories are very similar and very flat. GPC has selected the moisture content at the maximum measured density for their optimum moisture content, which is reasonable. However, since three of the GPC points, covering a range of moisture contents from 10.4 to 16.6 percent, have dry densities of 106.8, 106.6 and 106.6 pcf, it can be concluded that density is not very sensitive to moisture changes for this sample. The optimum probably lies

somewhere in the range of 10.4 to 16.6 percent. The LETCO value of 14.7 percent is within that range. Similarly for Sample S-7, GPC has reported dry densities of 108.4 and 108.6 pcf at moisture contents of 12.1 and 13.8 percent respectively. The optimum value appears to range from 12.1 to 13.8 percent with the LETCO value of 11.3 percent being closer to the GPC lower bound value.

2. For material with less than 5 percent fines the differences between the LETCO and GPC optimum moisture contents exceed the precision limits of ASTM D 1557. The reasons for these differences are not apparent from the test data.
3. Using the LETCO data, the following table was prepared to show moisture contents over which the required 97 percent relative compaction can be achieved.

Sample No.	γ_D at 97% $\times \gamma_{D \text{ max}}$	Moisture Range at 97% $\gamma_{D \text{ max}}$	OMC
	(PCF)	(percent)	(percent)
S-1	102.3	8-21*	15.5
S-2	100.2	6-22*	16.7
S-3	101.1	5-22*	19.3
S-4	105	10-21	18.1
S-5	102.6	13-22	18.5
S-6	103.8	10-19	16.0
S-7	107.2	6-20*	11.3
S-9	107.0	6-20*	14.8
S-10	104.6	6-19*	14.7
S-11	111.8	4-16.5*	13.2
S-12	109.9	3-16.5*	11.2

* Curve extrapolated

4.3 Permeability

Permeability tests were performed on two backfill samples; one with approximately 5.9 percent fines and the other with 11 percent fines. No permeability tests were performed on material with less than 5 percent fines. The data show that for material with 5.9 percent fines the coefficient of permeability ranged from approximately 2.0×10^{-3} in/sec to 6.0×10^{-3} cm/sec. For material with 11 percent fines, the permeability ranged from approximately 4.0×10^{-4} cm/sec to 4.0×10^{-3} cm/sec. A review of the data indicates the following:

1. The coefficient of permeability of both samples tested increases with decrease in the degree of compaction.
2. The coefficient of permeability decreases with increase in the fines content of the backfill material.
3. Based on criteria developed by Terzaghi and Peck (Reference 1), material with 5.9 percent fines may be classified as possessing medium permeability. Material with 11.0 percent fines may be classified as possessing medium to low permeability depending on the degree to which the material is compacted.
4. Materials with 5 to 12 percent fines when compacted to the specification requirements (97 percent or higher relative compaction) have medium to low permeability.

5.0 SUMMARY OF CONCLUSIONS

1. Based on the laboratory test data developed by LETCO and GPC it is concluded that differences in the maximum dry density values between the two laboratories are well within the precision limits set in the ASTM D 1557 test standard. Data from both laboratories show that for material types tested, the maximum dry density from ASTM D 1557 ranges from 101.9 to 115.3 pcf. These values of maximum dry density from laboratory tests are typical for these materials and are consistent with results previously obtained from laboratory tests performed by GPC and other laboratories. Maximum dry density values obtained by LETCO are slightly higher than those obtained by GPC but not enough to influence the degree of compaction reported by GPC. The laboratory test data support the conclusion that Category 1 backfill at Plant Vogtle has been compacted to the high degree of compaction committed to by GPC in the PSAR. For materials with fines ranging from 5 to 12 percent, the ASTM D 4253-83 method of test yields maximum densities that are lower than those obtained from ASTM D 1557. For materials with less than 5 percent fines the ASTM D 4253-83 (dry method) yielded higher maximum dry densities than the ASTM D 1557 test. However the differences in maximum unit weights between GPC's ASTM D 1557 and LETCO's ASTM D 4253-83 tests average 3.2 pcf for material with less than 5% fines. These differences are not considered significant in view of the fact that the field records indicate the compaction achieved by GPC to be well over the specified compaction criteria for materials within this range.

2. The compaction curves presented by LETCO show that for material types tested the required 97 percent relative compaction can be achieved over a wide range of moisture contents. This range is much wider than the limiting range of the construction specifications.
3. Permeability tests show that backfill material with 5 to 12 percent fines when compacted to 97 percent relative compaction will have medium to low permeability.

REFERENCES

1. Terzaghi, K., and R. B. Peck, 1967 Soil Mechanics and Engineering Practice 2nd edition, John Wiley and Sons, New York.

TABLE 1
COMPARISON OF GPC AND LETCO TEST DATA

Sample No.	LETCO		GPC		LETCO	GPC
	Max γ_D (pcf)	OMC (%)	Max γ_D pcf	OMC (%)	% Passing #200	% Passing #200
S-1	105.5	15.5	103.9	12.0	3.2	3.7
S-2	103.3	16.7	101.9	11.3	3.4	4.0
S-3	104.2	19.3	103.4	11.7	3.3	3.7
S-4	108.2	18.1	104.7	13.5	3.3	4.4
S-5	105.8	18.5	103.4	13.2	3.0	2.9
S-6	107.0	16.0	104.7	15.0	3.4	3.2
S-7	110.5	11.3	108.6	13.8	7.5	7.4
S-9	110.3	14.8	109.0	14.0	10.0	9.4
S-10	107.8	14.7	106.8	10.4	5.9	5.6
S-11	115.3	13.2	114.2	14.3	11.0	9.7
S-12	113.3	11.2	110.1	13.5	10.7	9.3
S-13	111.2	13.5	109.5	13.5	9.5	9.5

TABLE 2

COMPARISON OF ASTM D 1557 AND D 4353-83 TEST DATA

Sample No.	Percent Fines LETCO	Max γ_D ASTM D 1557		Max γ_D Wet	Max γ_D Dry
		LETCO	GPC	ASTM D 4353-83 LETCO	
S-1	3.2	105.5	103.9	105.9	107.5
S-2	3.4	103.3	101.9	104.2	105.8
S-3	3.3	104.2	103.4	105.8	105.9
S-4	3.3	108.2	104.7	104.0	107.1
S-5	3.0	105.8	103.4	103.8	107.7
S-6	3.4	107.0	104.7	104.0	107.3
S-7	7.5	110.5	108.6	110.2	108.4
S-8	10.0	110.3	109.0	107.0	101.7
S-9	5.9	107.8	106.8	111.3	106.8
S-10	11.0	115.3	114.2	106.9	106.9
S-11	10.7	113.3	110.1	99.5	100.7
S-12	9.5	111.2	109.5	107.3	102.6

APPENDIX 1

August 8, 1984



LAW ENGINEERING TESTING COMPANY
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Southern Company Services, Inc.
P.O. Box 2625
Birmingham, Alabama 35202

Attention: Mr. J. A. Bailey

Subject: Report of Confirmatory Laboratory Testing Program
For Category I Backfill
Vogtle Electrical Generating Plant
LETCo Job Number 7429

Gentlemen:

Law Engineering has completed the requested confirmatory laboratory testing of backfill materials, except for permeability testing. The results of the tests are presented in this report.

Twelve bags of soil were received from Plant Vogtle on June 15 and June 19, 1984. Initially testing of fourteen samples was planned. Due to sampling difficulties in the field, samples initially numbered 8 and 14 were not delivered to us.

In the laboratory the following tests were performed:

ASTM D 422-63	Particle Size Analysis of Soil
ASTM D 1557-78	Moisture Density Relations of Soils and Soil Aggregate Mixtures using 10 lb. Rammer and 18 inch Drop (Method A).
ASTM D 2049-69	Relative Density of Cohesionless Soil.
ASTM D 4253-83	Maximum Index Density of Soils using a Vibratory Table (Appendix non-mandatory information included).
ASTM D 4254-83	Minimum Index Density of Soils and Calculation of Relative Density.
ASTM D 423-66	Liquid Limit of Soil.
ASTM D 424-59	Plastic Limit and Plasticity Index of Soils.

Tests are presently underway to evaluate the permeability of two samples, Number 10 and 11. The results of the permeability testing will be reported to you as soon as it is completed.

Grain Size Tests

The grain size distribution of the twelve samples received was determined by procedures outlined in ASTM D 422-63. Six of the samples had less than 5% passing the No. 200 sieve, two of the samples had between 5 and 9% passing the No. 200 sieve and four of the samples had greater than 9% but less than 12% passing the No. 200 sieve. The particle size distribution for materials coarser than the No. 200 sieve was determined by passing the materials over a set of nested sieves. The particle size distribution for materials finer than the No. 200 sieve was determined by Hydrometer analysis for the three samples initially thought to be in the range of 9 to 12% passing the No. 200 sieve. One sample, Number 10, contained 10% passing the No. 200 sieve, so was outside its planned range of 5% to 9% passing the No. 200 sieve.

During the relative density testing, three grain size tests were performed on samples to determine if grain size changes (degradation) occurred due to performing several relative density tests on the same sample. This grain size testing indicated that the gradation of the soil did not change appreciably during the relative density testing.

The results of the grain size testing is shown on the individual grain size sheets and on the tabulated laboratory test results in the Appendix.

Modified Proctor Compaction Tests

Twelve modified proctor compaction tests were performed to evaluate the moisture density relations of the soils. During testing the soils typically "bled" water from the compaction mold. To evaluate this condition moisture content tests were performed on the soil samples both before and after compaction in the compaction mold. The loss of water from the compaction mold during compaction was measured to vary from approximately one half percent to approximately four percent for tests performed wet of optimum moisture content.

The results of the modified Proctor compaction testing are shown on the individual modified Proctor compaction test sheets and on the Table of Laboratory Test Results in the Appendix.

Relative Density Testing

Relative density testing was initiated using procedures outlined in ASTM D 2049-69. At the request of Mr. Joe Kane of the Nuclear Regulatory Commission, with approval from Mr. Walter Ferris of Bechtel Incorporated, who visited our laboratory to observe the testing from June 27, 1984 through June 29, 1984, the relative density program was modified. Three soil samples were selected from each of the grain size ranges, less than 5% passing the No. 200 sieve, 5% to 9% passing the No. 200 sieve, and 9% to 12% passing the No. 200 sieve to evaluate the optimum amplitude of vibration. Utilizing procedures outlined in ASTM D 4253-83, the

maximum density was determined by the dry method at selected points over a range of amplitudes of vibration. For each grain size range, the amplitude of vibrations which produced the highest maximum density was determined. This optimum amplitude of vibration (3600 cycles per second frequency) was then used within each grain size range for determining maximum density by both the wet and dry methods.

The minimum density of each sample was determined by procedures outlined in ASTM D 4254-83.

The results of the maximum and minimum density testing are shown on the attached relative density test sheets and on the plots of maximum density versus amplitude of vibration in the Appendix.

Plasticity Index

Plasticity index testing was performed on the three soil samples initially expected to fall within the range of 9% to 12% passing the No. 200 sieve by procedures outlined in ASTM D 423-66 and D-424-59. The testing indicated that each of the three samples was non-liquid, non-plastic.

Discussion

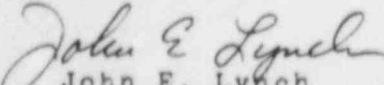
We understand that the results of the modified proctor compaction tests performed in our laboratory will be compared with like tests performed at Plant Vogtle. We point out the precision of this test as shown on Table 3 of ASTM D-1557 allows an acceptable range of two results from different laboratory to be 4% of the mean value. The multilaboratory standard deviation of maximum density by the ASTM D 1557-82 method is shown as ± 1.66 .

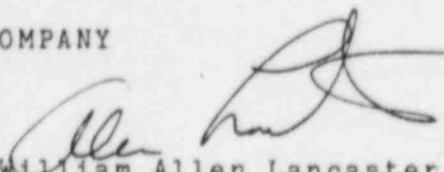
For samples in the 0 - 5% and 5% - 9% passing the #200 sieve grain size range, the relative density test indicated maximum densities ranging from approximately one pound per cubic foot less to approximately three and one half pounds per cubic foot greater than the modified Proctor maximum density. For soils in the 9% to 12% passing the No. 200 sieve grain size range, maximum density determined by the relative density method ranged from approximately three to eight pounds per cubic foot less than the modified Proctor maximum density.

Thank you for the opportunity of working with you on this project. If you have any questions concerning this project or if we can be of additional assistance to you, please contact us.

Very truly yours,

LAW ENGINEERING TESTING COMPANY


John E. Lynch
Laboratory Manager


William Allen Lancaster
Civil Engineer



APPENDIX

**LAW ENGINEERING TESTING COMPANY**

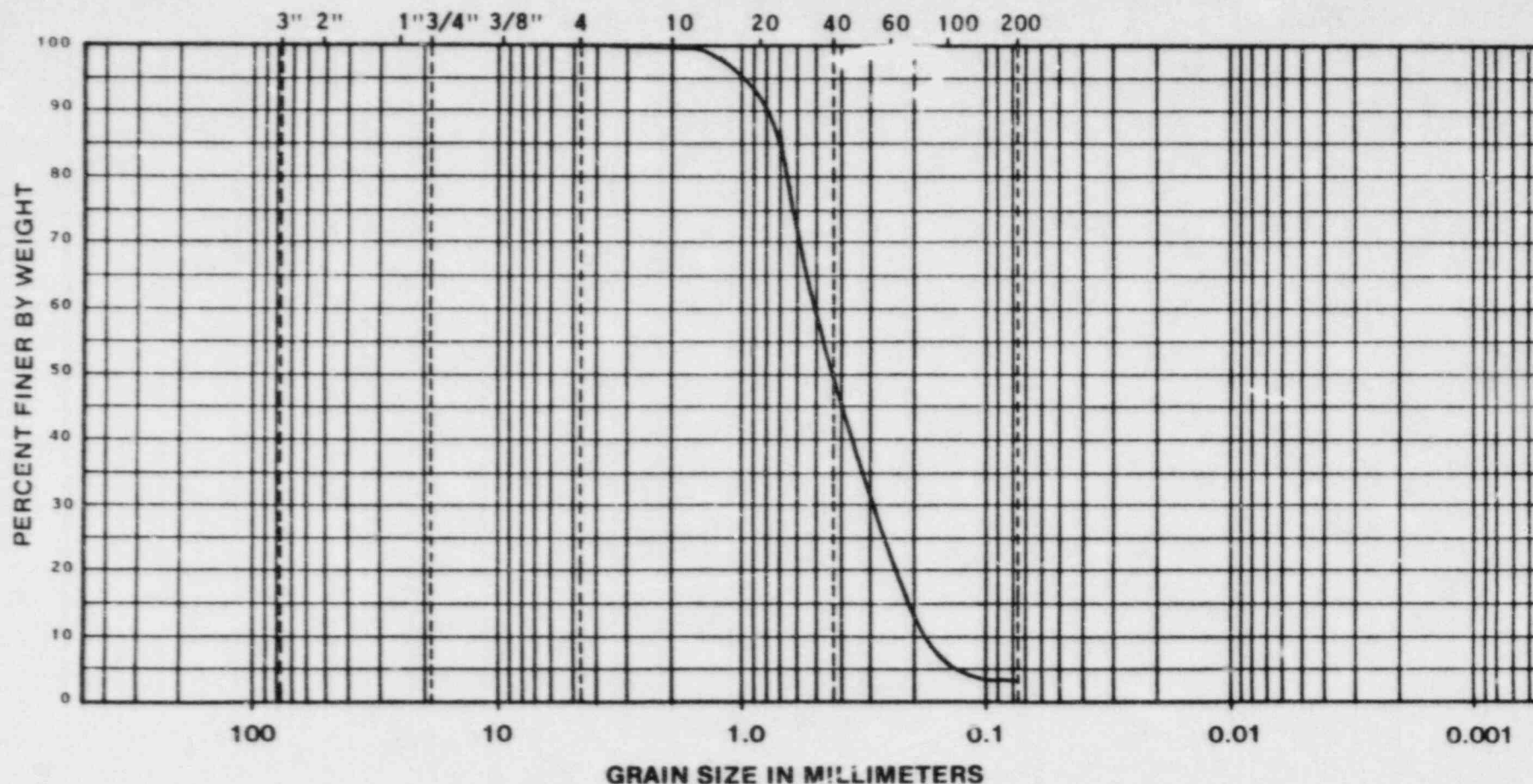
geotechnical, environmental & construction materials consultants

396 PLASTERS AVENUE N.E.
P.O. BOX 13260 • ATLANTA, GEORGIA 30324
(404) 873-4761JOB NO. 7427 SHEET 1 OF 1JOB NAME G.P.C. Vogtle PlantBY K.D. DATE 7-30-84CHECKED BY WAC DATE 8/6/84*Sample Classification*

Sample No.	Sample Description	Sample Source	Moist. Content %	Grain Size			Grain Size Distribution			Unified Class.
				% Pass #10	% Pass #40	% Pass #200	% Sand	% Silt	% clay	
#1	Pink fine to med. Sand	Borrow mixed	4.2	100.0	48.6	3.2	96.8	-	-	SP
#2	Pink fine to med. Sand	Borrow mixed	3.6	100.0	58.5	3.4	96.6	-	-	SP
#3	Tan fine to med. Sand	Borrow mixed	3.6	100.0	51.7	3.3	96.7	-	-	SP
#4	Tan fine to med. Sand	Borrow mixed	2.5	100.0	38.4	3.3	96.7	-	-	SP
#5	Pink fine to med. Sand	Field Unmixed	8.9	100.0	53.1	3.0	97.0	-	-	SP
#6	Pink fine to med. Sand	Field Unmixed	7.8	100.0	48.1	3.4	96.6	-	-	SP
#7	Orange fine to med. Sand	Borrow mixed	2.5	99.4	67.8	7.5	92.5	-	-	SP-SM
#9	Orange fine to med. Sand	Field Unmixed	4.0	99.9	75.9	10.0	90.0	-	-	SP-SM
#10	Light brown fine to med. Sand	Field Unmixed	1.5	99.2	62.5	5.9	94.1	-	-	SP-SM
#11	Tan fine to med. Sand	Borrow mixed	5.2	98.2	66.4	11.0	89.0	5.8	5.2	SP-SM
#12	Brown fine to med. Sand	Borrow mixed	8.0	100.0	81.2	10.7	89.3	3.7	7.0	SP-SM
#13	Orange fine to med. Sand	Field Unmixed	4.2	99.5	75.4	9.5	90.5	3.6	5.9	SP-SM

BOUL- DERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

U. S. STANDARD SIEVE SIZES

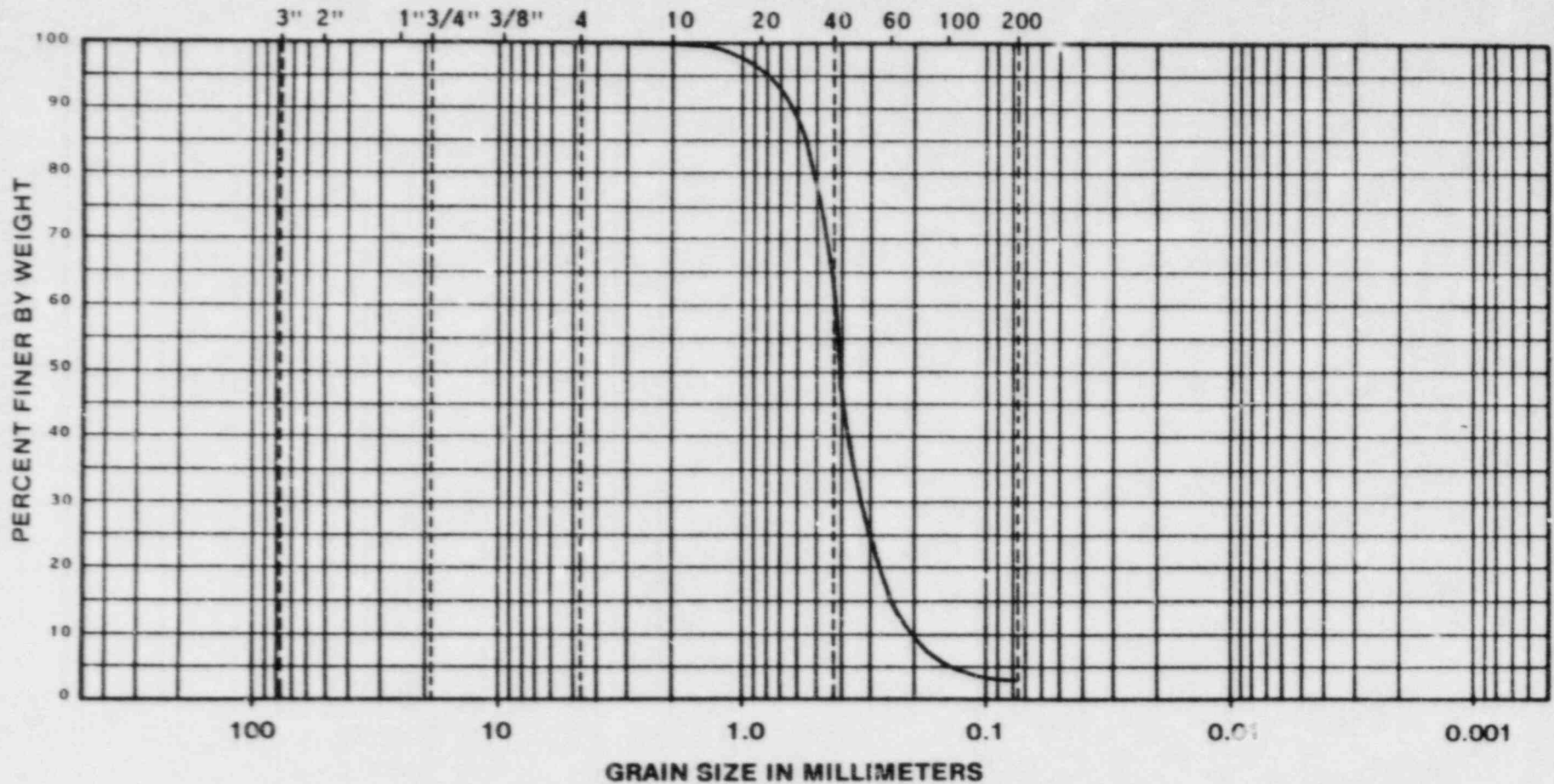


**Law Engineering
Testing Company**
Grain Size Distribution

BORING NO.	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
Bag #1 S-1	Borrow					Pink fine to med. Sand (SP)
JOB NO.	Mixed					
7429						

BOUL- DERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

U. S. STANDARD SIEVE SIZES



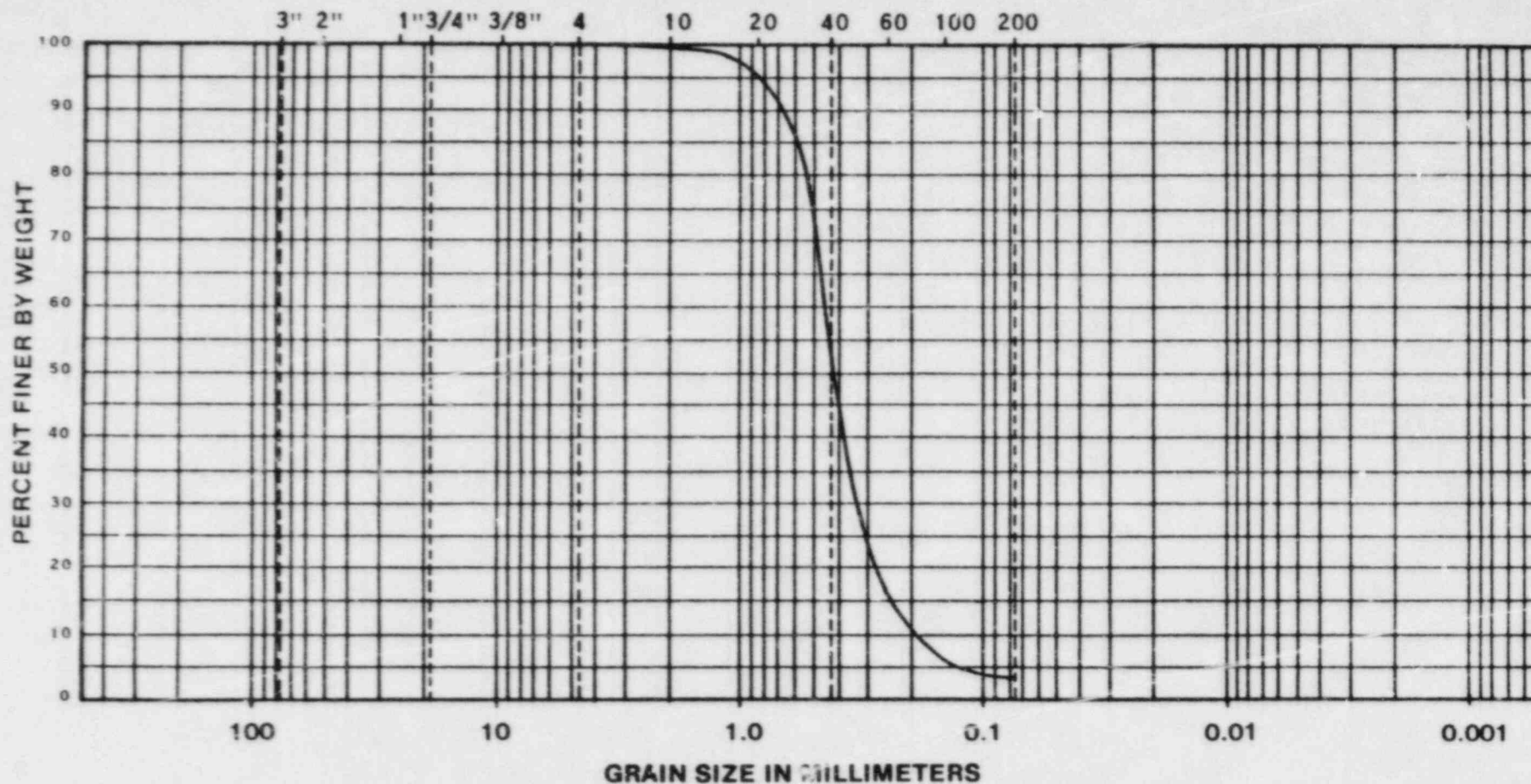
**Law Engineering
Testing Company**

Grain Size Distribution

BORING NO.	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
Bag 1 S-2	Borrow					Pink Fine to Med. Sand
JOB NO.	Mixed					(SP)
7429						

BOUL- DERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

U. S. STANDARD SIEVE SIZES



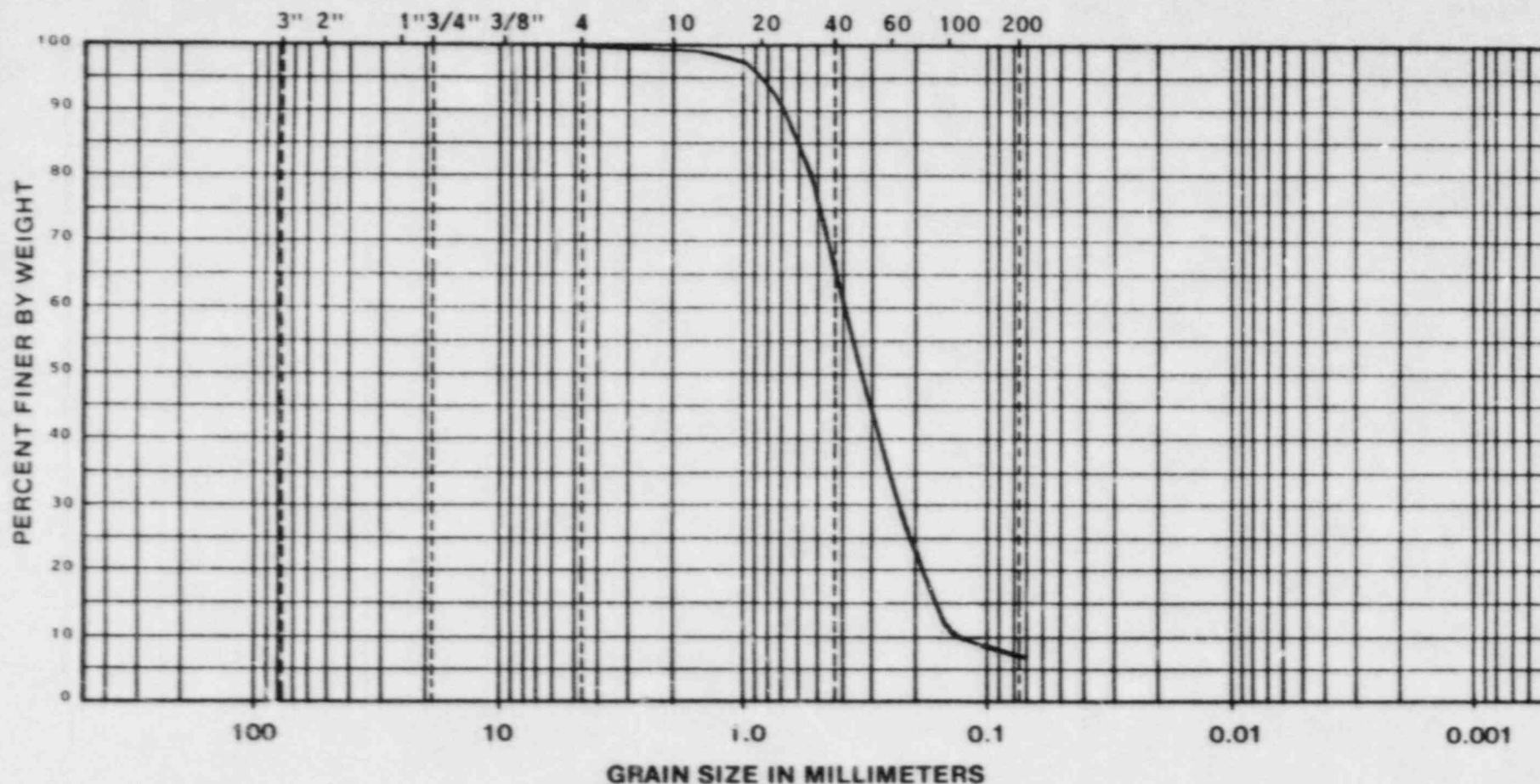
**Law Engineering
Testing Company**

Grain Size Distribution

BORING NO.	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
Bag 1 S-3	Borrow					Tan Fine to Med. Sand (SP)
JOB NO. 7429	Mixed					

BOUL- DERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

U. S. STANDARD SIEVE SIZES



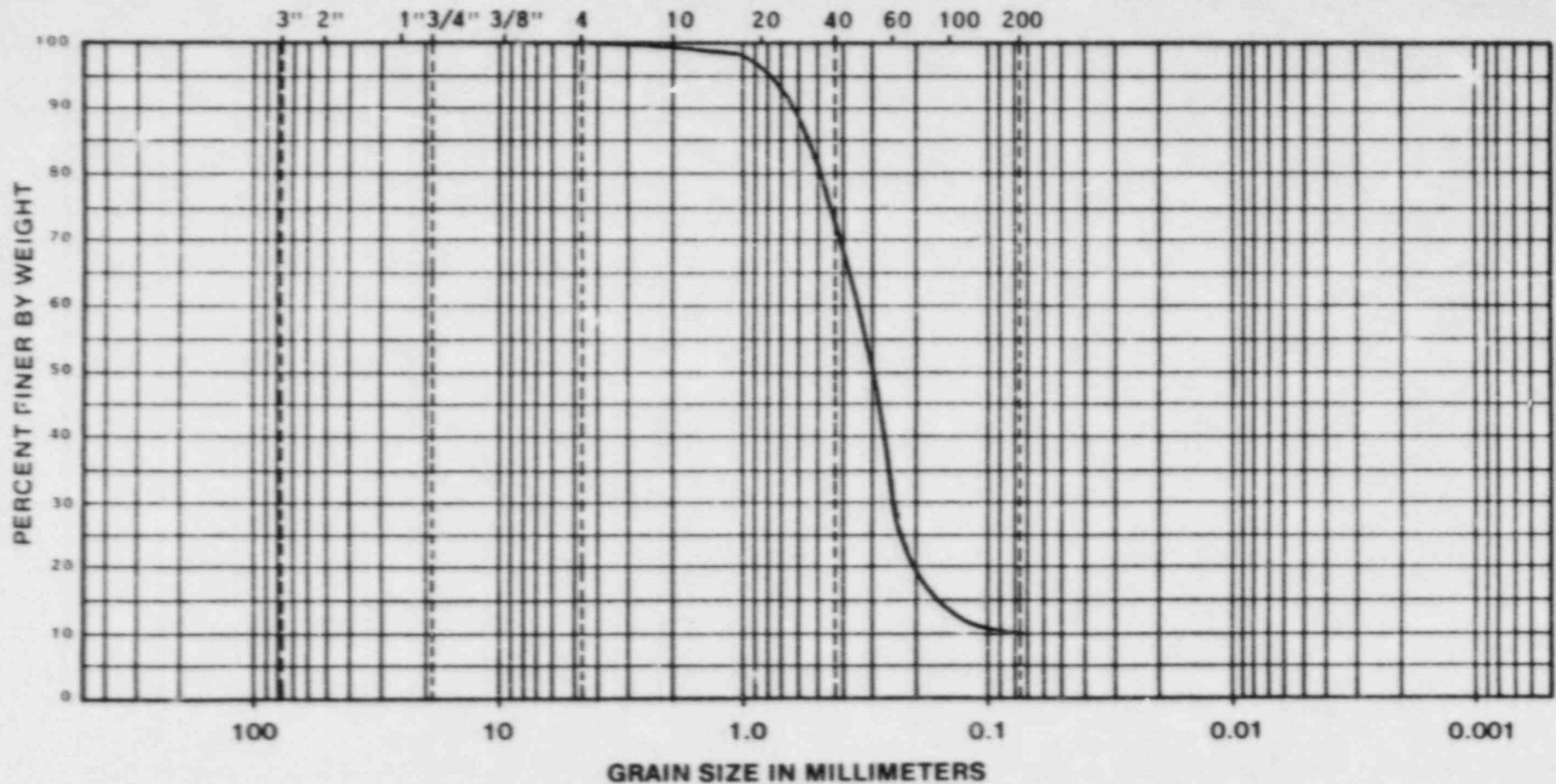
**Law Engineering
Testing Company**

Grain Size Distribution

BORING NO.	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
Bag 1 5-7	Borrow					Orange Fine to Med. Sand (SP-SM)
JOB NO. 7429	Mixed					

BOUL- DERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

U. S. STANDARD SIEVE SIZES



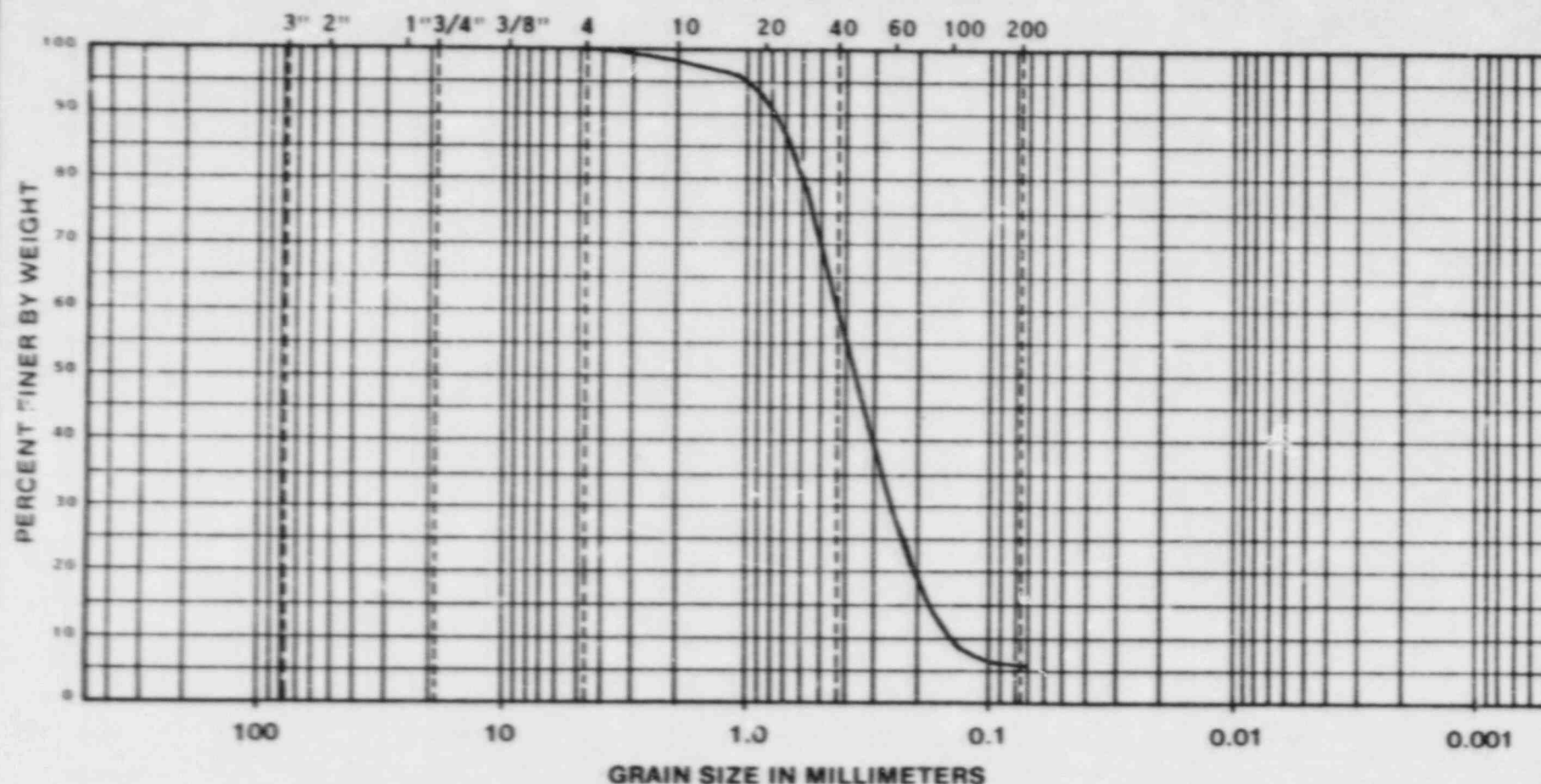
**Law Engineering
Testing Company**

Grain Size Distribution

BORING NO.	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
Bag 1 S-9	Field					Orange Fine to Med. Sand (SP-SM)
JOB NO. 7429	Unmixed					

BOULDER SIZES	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

U. S. STANDARD SIEVE SIZES



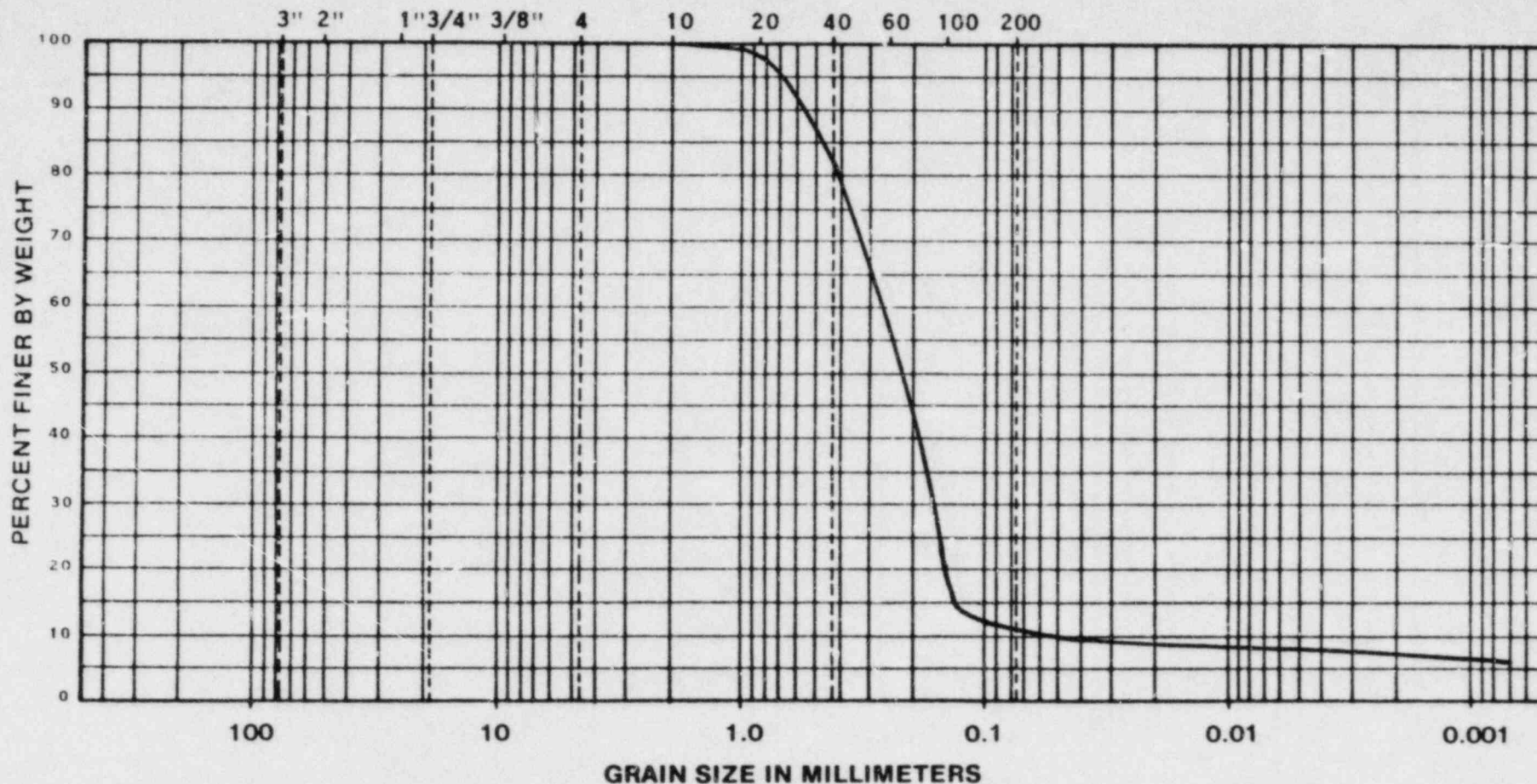
**Law Engineering
Testing Company**

Grain Size Distribution

BORING NO.	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
Bag 1 S-10	Field					Lt. Brown Fine to Med. Sand (SP-SM)
JOB NO. 7429	Unmixed					

BOUL- DERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

U. S. STANDARD SIEVE SIZES



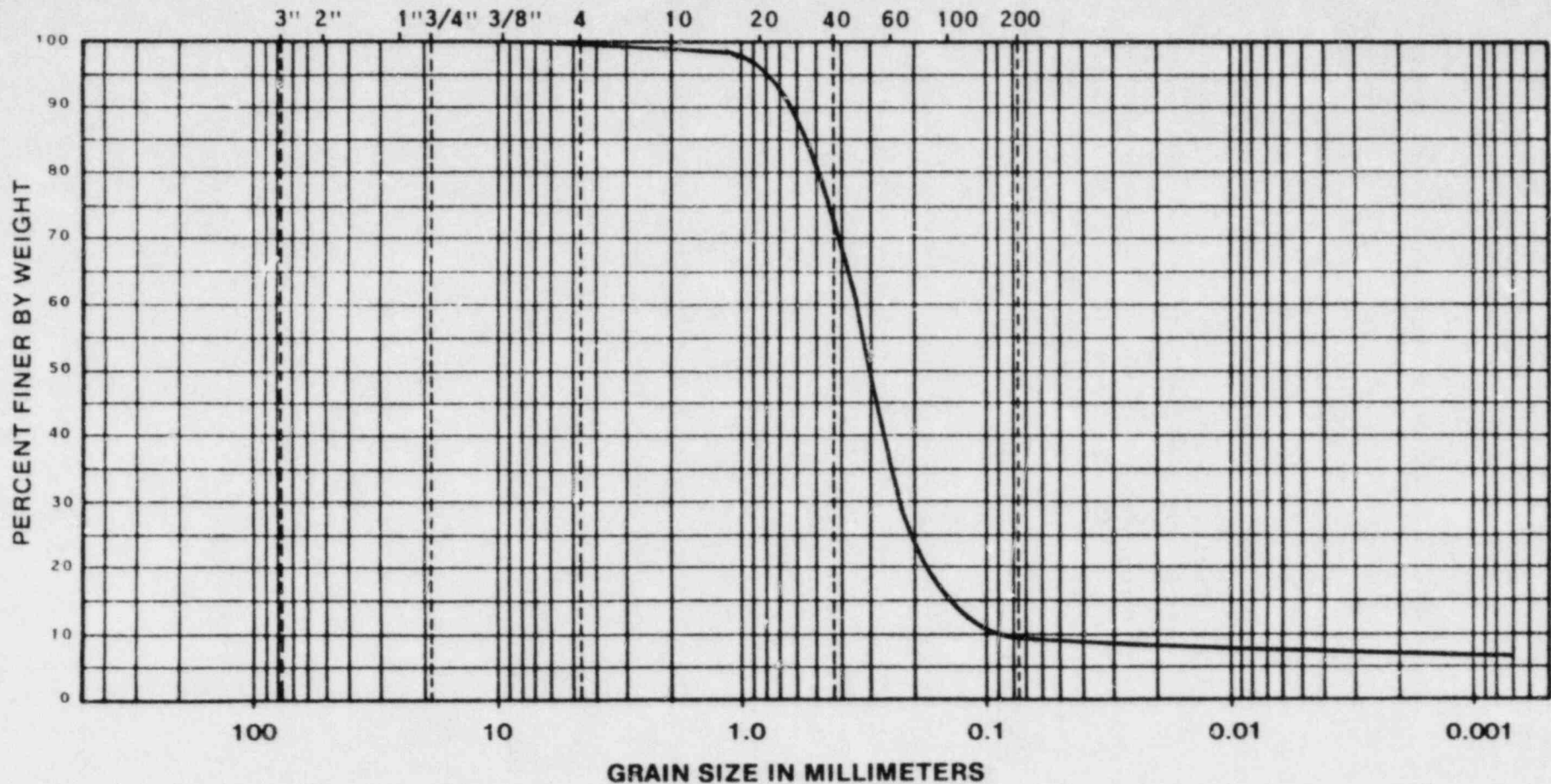
**Law Engineering
Testing Company**

Grain Size Distribution

BORING NO.	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
Bag 1 5-12	Borrow		NL	NP	-	Brown Fine to Med. Sand
JOB NO. 7429	Mixed					(SP-SM)

BOUL- DERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

U. S. STANDARD SIEVE SIZES



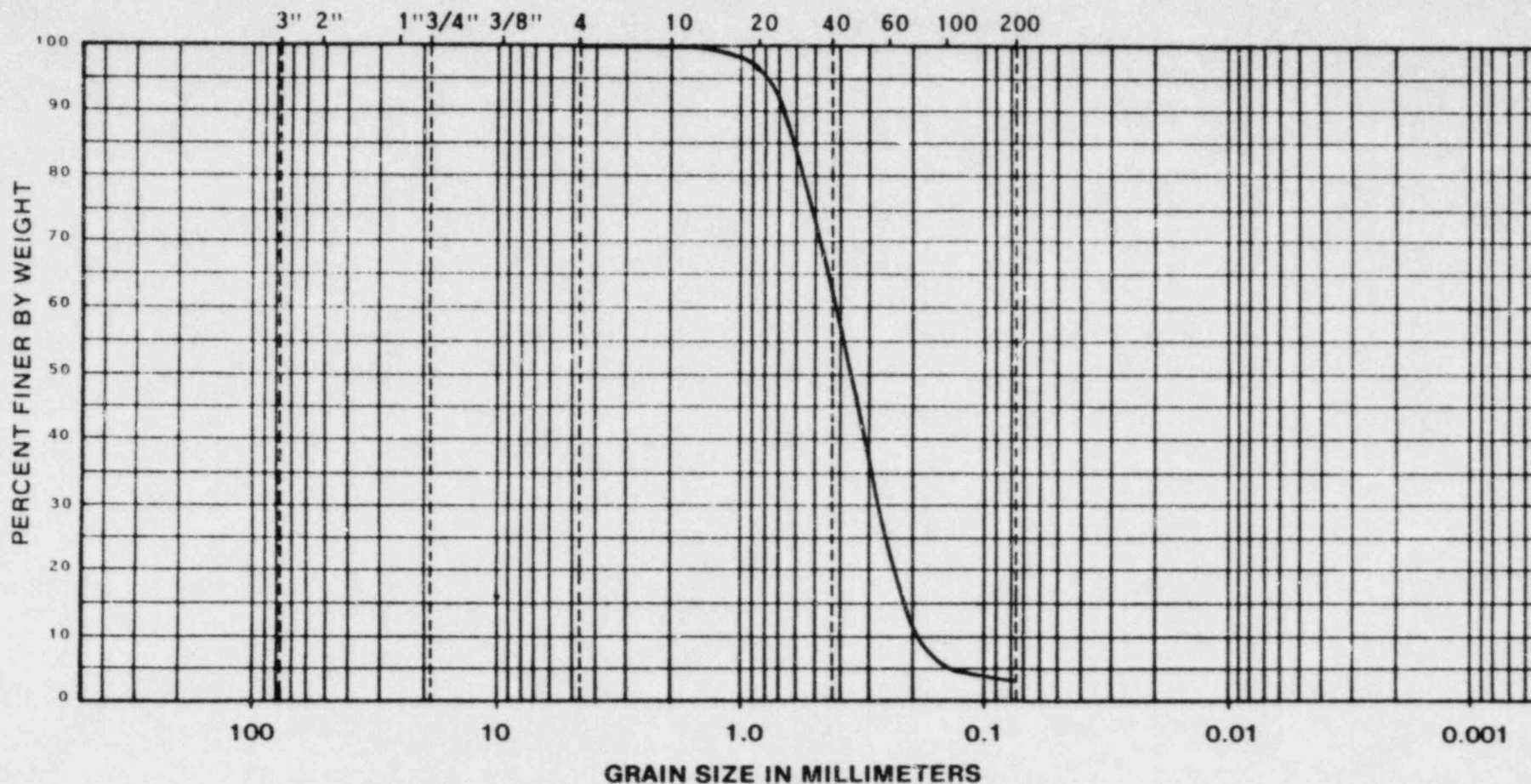
**Law Engineering
Testing Company**

Grain Size Distribution

BORING NO.	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
Bag 1 S-13	Field		NL	NP	-	Orange Fine to Med. Sand
JOB NO.	Unmixed					(SP-SM)
7429						

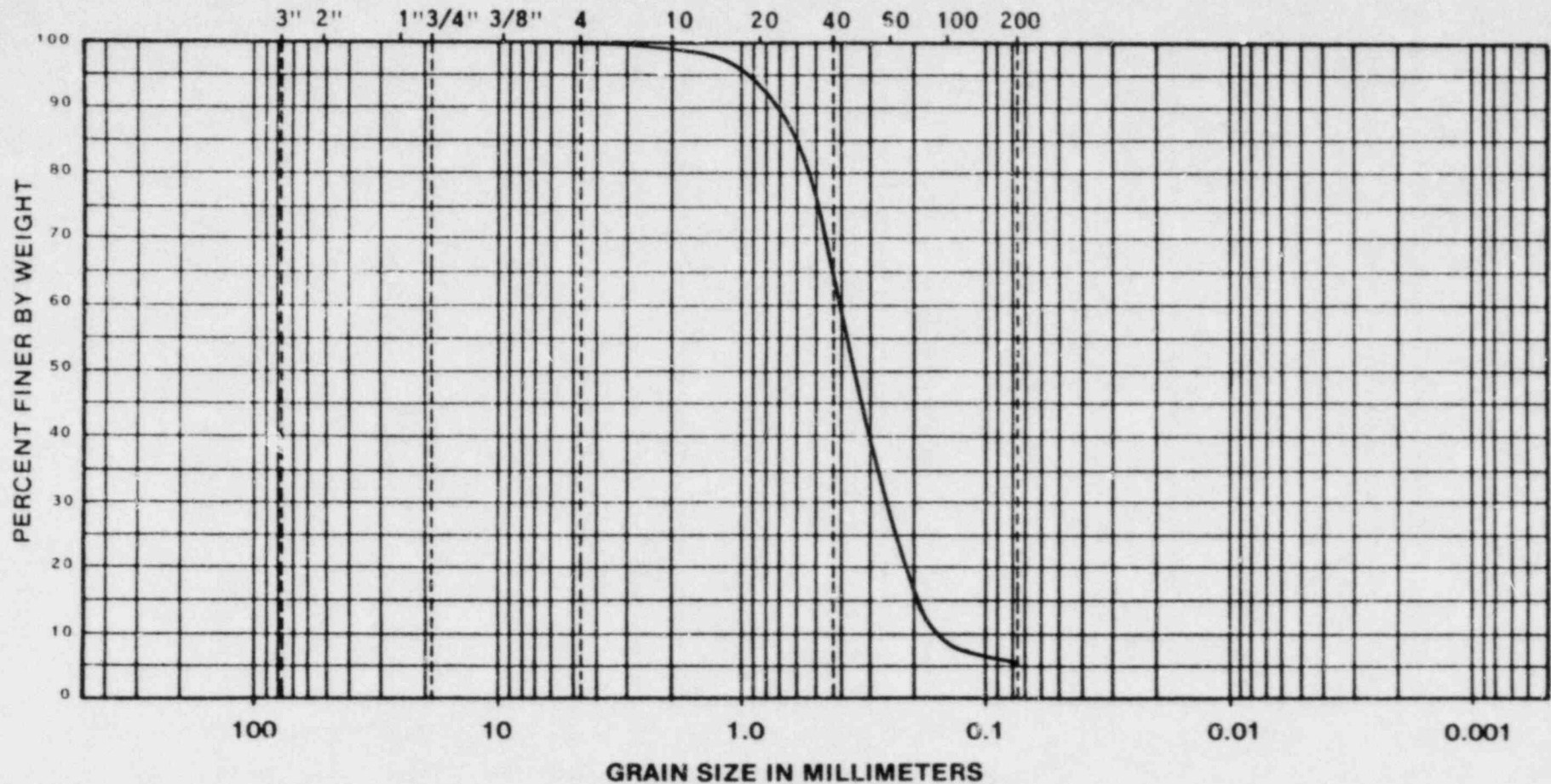
BOUL- DERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

U. S. STANDARD SIEVE SIZES



BOUL- DERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

U. S. STANDARD SIEVE SIZES



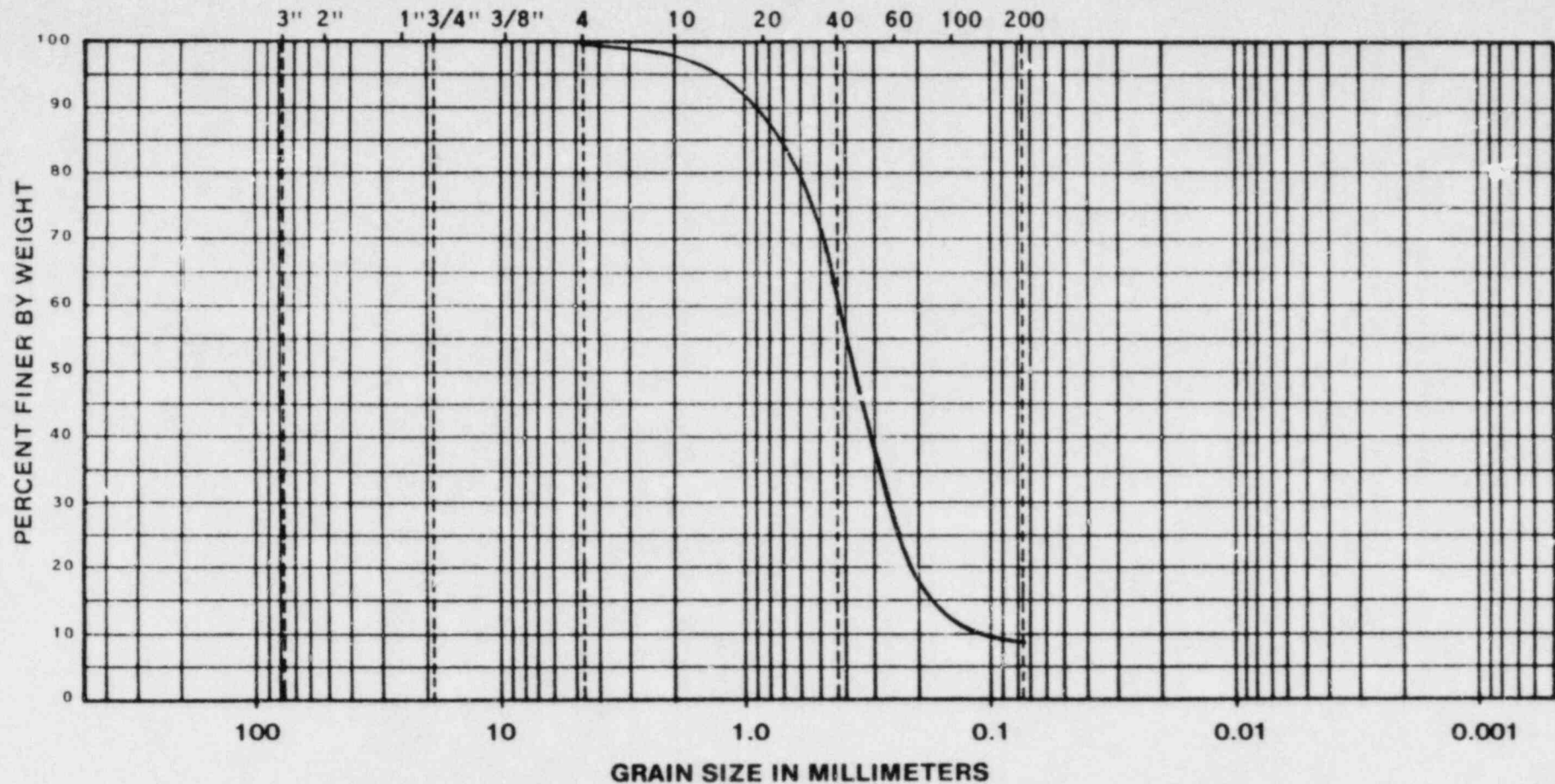
**Law Engineering
Testing Company**

Grain Size Distribution

BORING NO.	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
Bag 1 S-7	Borrow					Run After Relative Density Test
JOB NO. 7429	Mixed					

BOUL- DERS	COBBLES	GRAVEL		SAND			FINES	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

U. S. STANDARD SIEVE SIZES



**Law Engineering
Testing Company**

Grain Size Distribution

BORING NO.	DEPTH	NAT WC	LL	PL	PI	DESCRIPTION OR CLASSIFICATION
Bag 1 5-11	Borrow					Run After Relative Density Test
JOB NO. 7429	Mixed					

LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS N/A
SAMPLE IDENTIFICATION IS S-1 BAG 1 SOURCE BORROW MIXED

SPECIFIC GRAVITY = 2.70
NATURAL MOISTURE CONTENT = 4.2 PERCENT

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	.1	100.0
20	17.1	93.3
40	131.4	48.6
60	198.3	22.4
100	242.0	5.2
200	247.1	3.2

GRAIN SIZE DISTRIBUTION

.0% GRAVEL 96.8% SAND 3.2% FINES
UNIFORMITY COEF = 2.98 COEF OF CURVATURE = .96

UNIFIED SOIL CLASSIFICATION IS SP

Tested By	KD
Date	6-19-84
Reviewed By	WAC
Checked	8/1/84



LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS N/A
SAMPLE IDENTIFICATION IS S-2 BAG-1 SOURCE BORROW MIXED

SPECIFIC GRAVITY = 2.70
NATURAL MOISTURE CONTENT = 3.6 PERCENT

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	.0	100.0
20	11.1	96.5
40	132.1	58.5
60	261.2	17.9
100	301.9	5.2
200	307.5	3.4

GRAIN SIZE DISTRIBUTION

.0% GRAVEL 96.6% SAND 3.4% FINES
UNIFORMITY COEF = 2.33 COEF OF CURVATURE = 1.10

UNIFIED SOIL CLASSIFICATION IS SF

Tested By *KD*
Date *6/20/84*
see
8/1/84



LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS N/A
SAMPLE IDENTIFICATION IS S-3 BAG-1 SOURCE MIXED

SPECIFIC GRAVITY = 2.70
NATURAL MOISTURE CONTENT = 3.6 PERCENT

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	.0	100.0
20	12.2	95.5
40	131.1	51.7
60	212.8	21.7
100	257.2	5.3
200	262.6	3.3

GRAIN SIZE DISTRIBUTION

.0% GRAVEL 96.7% SAND 3.3% FINES
UNIFORMITY COEF = 2.81 COEF OF CURVATURE = .99

UNIFIED SOIL CLASSIFICATION IS SP

KD
6/20/84

MAC

3/2/74



LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS N/A
SAMPLE IDENTIFICATION IS S-4 BAG-1 SOURCE BORROW MIXED

SPECIFIC GRAVITY = 2.70
NATURAL MOISTURE CONTENT = 2.5 PERCENT

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	.0	100.0
20	17.6	93.7
40	171.5	38.4
60	231.7	16.8
100	264.9	4.8
200	269.0	3.3

GRAIN SIZE DISTRIBUTION

.0% GRAVEL 96.7% SAND 3.3% FINES
UNIFORMITY COEF = 3.03 COEF OF CURVATURE = 1.11

UNIFIED SOIL CLASSIFICATION IS SP

KD
6/20/84
was
8/7/84



LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS N/A
SAMPLE IDENTIFICATION IS S-5 BAG-1 SOURCE FIELD UNMIXED

SPECIFIC GRAVITY = 2.70
NATURAL MOISTURE CONTENT = 8.9 PERCENT

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	.1	100.0
20	12.7	95.5
40	133.7	53.1
60	226.2	20.6
100	271.4	4.8
200	276.3	3.0

GRAIN SIZE DISTRIBUTION

0% GRAVEL 97.0% SAND 3.0% FINES
UNIFORMITY COEF = 2.68 COEF OF CURVATURE = 1.00

UNIFIED SOIL CLASSIFICATION IS SP

KD
6/20/84

WMC
5/1/84



LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS N/A
SAMPLE IDENTIFICATION IS S-6 BAG-1 SOURCE FIELD UNMIXED

SPECIFIC GRAVITY = 2.70
NATURAL MOISTURE CONTENT = 7.8 PERCENT

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	.0	100.0
20	18.1	94.5
40	169.7	48.1
60	258.9	20.8
100	309.9	5.2
200	315.8	3.4

GRAIN SIZE DISTRIBUTION

.0% GRAVEL 96.6% SAND 3.4% FINES
UNIFORMITY COEF = 2.93 COEF OF CURVATURE = .99

UNIFIED SOIL CLASSIFICATION IS SP

KD
6/20/84
WR
9/7/84

LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS N/A
SAMPLE IDENTIFICATION IS BAG-1 SAMPLE 7 BORROW MIXED

SPECIFIC GRAVITY = 2.70

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	2.3	99.4
20	18.0	95.3
40	124.5	67.7
60	260.8	32.4
100	342.5	11.2
200	357.1	7.5

GRAIN SIZE DISTRIBUTION

.0% GRAVEL 92.5% SAND 7.5% FINES
UNIFORMITY COEF = 3.08 COEF OF CURVATURE = 1.20

KD
6/25/84
ms
8/2/84



LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS N/A
SAMPLE IDENTIFICATION IS BAG-1 SAMPLE 9 FIELD UNMIXED

SPECIFIC GRAVITY = 2.70

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	.4	99.9
20	9.6	97.6
40	98.0	75.9
60	279.8	31.3
100	355.3	12.8
200	366.7	10.0

GRAIN SIZE DISTRIBUTION

.0% GRAVEL 90.0% SAND 10.0% FINES
UNIFORMITY COEF = 4.81 COEF OF CURVATURE = 2.20

KD
6/25/84

mean
2/2/85



LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS N/A
SAMPLE IDENTIFICATION IS BAG-1 SAMPLE 10 FIELD UNMIXED

SPECIFIC GRAVITY = 2.70

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	3.2	99.2
20	24.5	94.0
40	153.8	62.5
60	294.4	28.2
100	372.6	9.1
200	385.6	5.9

GRAIN SIZE DISTRIBUTION

.0% GRAVEL 94.1% SAND 5.9% FINES
UNIFORMITY COEF = 2.65 COEF OF CURVATURE = 1.07

KD
6/25/84

W.M.
7/7/84



LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS N/A
SAMPLE IDENTIFICATION IS BAG 1 SAMPLE 11

SPECIFIC GRAVITY = 2.70

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	2.8	98.2
20	16.9	89.1
40	52.1	66.4
60	106.3	31.4
100	130.8	15.6
200	137.9	11.1

HYDROMETER ANALYSIS ON SOIL PASSING NO.200 SIEVE

ELAPSED TIME	HYDRO READING	CORR HYDRO	TEMP	DIA IN MM	PERCENT FINER
1.0	19.5	15.2	24.	.0467	9.7
2.0	17.0	12.7	24.	.0336	8.1
5.0	16.5	12.2	24.	.0213	7.8
15.0	16.0	11.7	24.	.0123	7.4
30.0	15.0	10.7	24.	.0088	6.8
60.0	14.0	9.7	24.	.0062	6.2
254.0	13.0	8.7	24.	.0030	5.5
4320.0	12.0	7.7	24.	.0007	4.9

PLASTICITY PROPERTIES OF MAT. PASSING NO. 40 SIEVE

SOIL SAMPLE IS NON-PLASTIC

GRAIN SIZE DISTRIBUTION

.0% GRAVEL 88.9% SAND 5.8% SILT 5.2% CLAY
UNIFORMITY COEF = 7.31 COEF OF CURVATURE = 2.81

UNIFIED SOIL CLASSIFICATION IS SW-SM

AASHTO SOIL CLASSIFICATION IS A-2-4 WITH A GROUP INDEX OF 0

KD
6/25/84

8/7/84



LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS N/A
SAMPLE IDENTIFICATION IS BAG 1 SAMPLE 12 BORROW MIXED

SPECIFIC GRAVITY = 2.70

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	.0	100.0
20	1.8	98.9
40	28.9	81.2
60	67.8	55.9
100	130.9	15.0
200	137.5	10.7

HYDROMETER ANALYSIS ON SOIL PASSING NO.200 SIEVE

ELAPSE TIME	HYDRO READING	CORR HYDRO	TEMP	DIA IN MM	PERCENT FINER
1.0	21.0	16.7	24.	.0463	10.7
2.0	20.0	15.7	24.	.0329	10.1
5.0	19.5	15.2	24.	.0209	9.7
15.0	19.5	15.2	24.	.0121	9.7
30.0	18.5	14.2	24.	.0086	9.1
60.0	17.5	13.2	24.	.0061	8.5
254.0	17.0	12.7	24.	.0030	8.1
4320.0	13.0	8.7	24.	.0007	5.6

PLASTICITY PROPERTIES OF MAT. PASSING NO. 40 SIEVE

SOIL SAMPLE IS NON-PLASTIC

GRAIN SIZE DISTRIBUTION

.0% GRAVEL 89.3% SAND 3.7% SILT 7.0% CLAY
UNIFORMITY COEF = 9.04 COEF OF CURVATURE = 4.07

UNIFIED SOIL CLASSIFICATION IS SP-SM

AASHTO SOIL CLASSIFICATION IS A-2-4 WITH A GROUP INDEX OF 0

KD
6125186

MR
7/1/84



LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS N/A
SAMPLE IDENTIFICATION IS BAG 1 SAMPLE 13 FIELD UNMIXED

SPECIFIC GRAVITY = 2.70

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
38	.0	100.0
4	.5	99.7
10	.8	99.5
20	4.4	97.0
40	36.2	75.4
60	96.2	34.6
100	128.3	12.7
200	133.0	9.5

HYDROMETER ANALYSIS ON SOIL PASSING NO.200 SIEVE

ELAPSED TIME	HYDRO READING	CORR HYDRO	TEMP	DIA IN MM	PERCENT FINER
1.0	17.5	13.2	24.	.0473	8.9
2.0	17.0	12.7	24.	.0336	8.5
5.0	16.5	12.2	24.	.0213	8.2
15.0	16.0	11.7	24.	.0123	7.8
30.0	15.0	10.7	24.	.0088	7.2
60.0	14.0	9.7	24.	.0062	6.5
254.0	13.5	9.2	24.	.0030	6.2
4320.0	12.5	8.2	24.	.0007	5.5

PLASTICITY PROPERTIES OF MAT. PASSING NO. 40 SIEVE

SOIL SAMPLE IS NON-PLASTIC

GRAIN SIZE DISTRIBUTION

.3% GRAVEL 90.2% SAND 3.6% SILT 5.9% CLAY
UNIFORMITY COEF = 4.15 COEF OF CURVATURE = 1.72

UNIFIED SOIL CLASSIFICATION IS SP-SM

AASHTO SOIL CLASSIFICATION IS A3 WITH A GROUP INDEX OF 0

KD
6/25/84
MSL
8/2/84



LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429
BORING NUMBER IS BAG 1
SAMPLE IDENTIFICATION IS SAMPLE 5 AFTER RELATIVE DENSITY TEST

SPECIFIC GRAVITY = 2.70

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	.1	100.0
20	6.2	96.9
40	79.0	60.1
60	152.4	23.8
100	189.5	5.2
200	193.9	3.1

GRAIN SIZE DISTRIBUTION

.0% GRAVEL 96.9% SAND 3.1% FINES
UNIFORMITY COEF = 2.40 COEF OF CURVATURE = 1.06

UNIFIED SOIL CLASSIFICATION IS SP

LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGT/E 7429
BORING NUMBER IS BAG 1
SAMPLE IDENTIFICATION IS SAMPLE 7 AFTER RELATIVE DENSITY TEST

SPECIFIC GRAVITY = 2.70

SIEVE ANALYSIS

SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	1.4	99.3
20	11.4	94.3
40	70.5	64.8
60	136.9	31.6
100	182.0	9.0
200	187.7	6.2

GRAIN-SIZE DISTRIBUTION

.0% GRAVEL 93.9% SAND 6.2% FINES
UNIFORMITY COEF = 2.58 COEF OF CURVATURE = .97

LAW ENGINEERING TESTING COMPANY
SOIL SAMPLE DATA

PROJECT NAME & NO. ARE PLANT VOGTLE 7429

BORING NUMBER IS BAG 1

SAMPLE IDENTIFICATION IS SAMPLE 11 AFTER RELATIVE DENSITY TEST

SPECIFIC GRAVITY = 2.70

SIEVE ANALYSIS

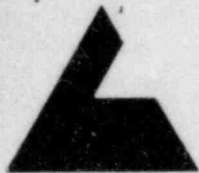
SIEVE NUMBER	#CUM WT RETAINED	PERCENT FINER
4	.0	100.0
10	4.0	98.0
20	21.6	89.2
40	70.1	64.9
60	141.6	29.2
100	173.3	13.4
200	181.5	9.2

GRAIN-SIZE DISTRIBUTION

.0% GRAVEL 90.8% SAND 9.2% FINES

UNIFORMITY COEF = 4.51 COEF OF CURVATURE = 1.85



**LAW ENGINEERING TESTING COMPANY**

geotechnical, environmental & construction materials consultants

396 PLASTERS AVENUE N.E.
P.O. BOX 13260 • ATLANTA, GEORGIA 30324
(404) 873-4761JOB NO. 7429 SHEET 1 OF 1JOB NAME G.P. C., Vogtle plantBY K.D. DATE 7/30/84CHECKED BY WMC DATE 8/6/84*Laboratory Proctor and Relative Density Results*

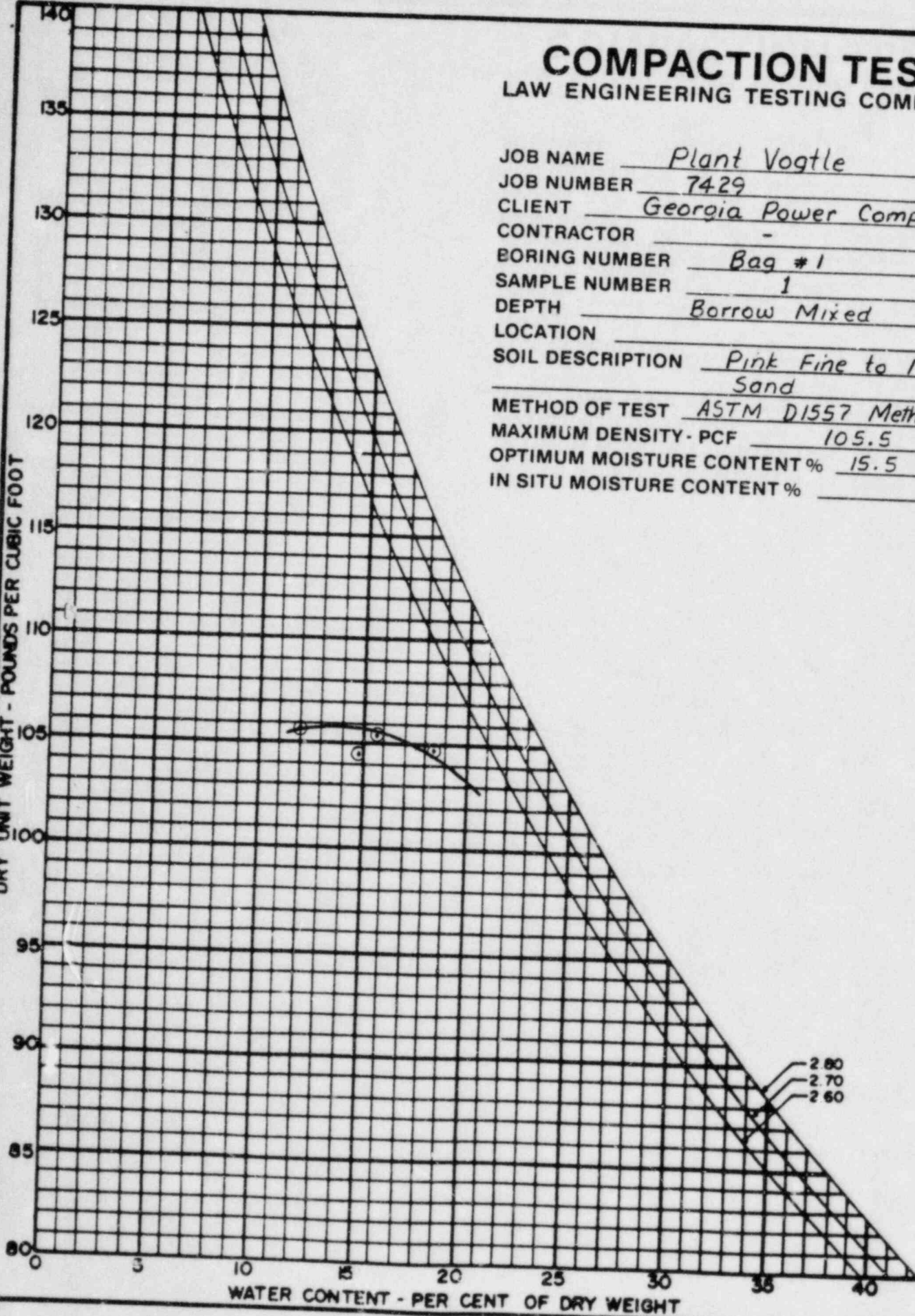
Sample No.	Modified Proctor		Relative Density			Vibration Amplitude (Peak to Peak) (2 Yp, In.)	Specific Gravity
	Max. Dry Density (Pcf)	Optimum moisture %	Min. Dry Density (Pcf)	Max. Wet Density (Pcf)	Max. Dry Density (Pcf)		
#1	105.5	15.5	91.4	105.9	107.5	0.0175	2.63
#2	103.3	16.7	86.0	104.2	105.8	0.0175	2.67
#3	104.2	19.3	87.3	105.8	105.9	0.0175	2.66
#4	108.2	18.1	88.3	104.0	107.1	0.0175	2.68
#5	105.8	18.5	88.6	103.8	107.7	0.0175	2.67
#6	107.0	16.0	89.9	104.0	107.3	0.0175	2.67
#7	110.5	11.3	89.7	110.2	108.4	0.022	2.64
#8	110.3	14.8	82.9	107.0	101.7	0.022	2.66
#10	107.8	14.7	88.4	111.3	106.8	0.022	2.65
#11	115.3	13.2	86.9	106.9	106.9	0.025	2.67
#12	113.3	11.2	81.4	99.5	100.7	0.025	2.67
#13	111.2	13.5	82.5	107.2	102.6	0.025	2.68

COMPACTION TEST

LAW ENGINEERING TESTING COMPANY.

JOB NAME Plant Vogtle
 JOB NUMBER 7429
 CLIENT Georgia Power Company
 CONTRACTOR -
 BORING NUMBER Bag #1
 SAMPLE NUMBER 1
 DEPTH Borrow Mixed
 LOCATION -
 SOIL DESCRIPTION Pink Fine to Med. Sand
 METHOD OF TEST ASTM D1557 Meth. "A"
 MAXIMUM DENSITY - PCF 105.5
 OPTIMUM MOISTURE CONTENT % 15.5
 IN SITU MOISTURE CONTENT % -

DRY UNIT WEIGHT - POUNDS PER CUBIC FOOT

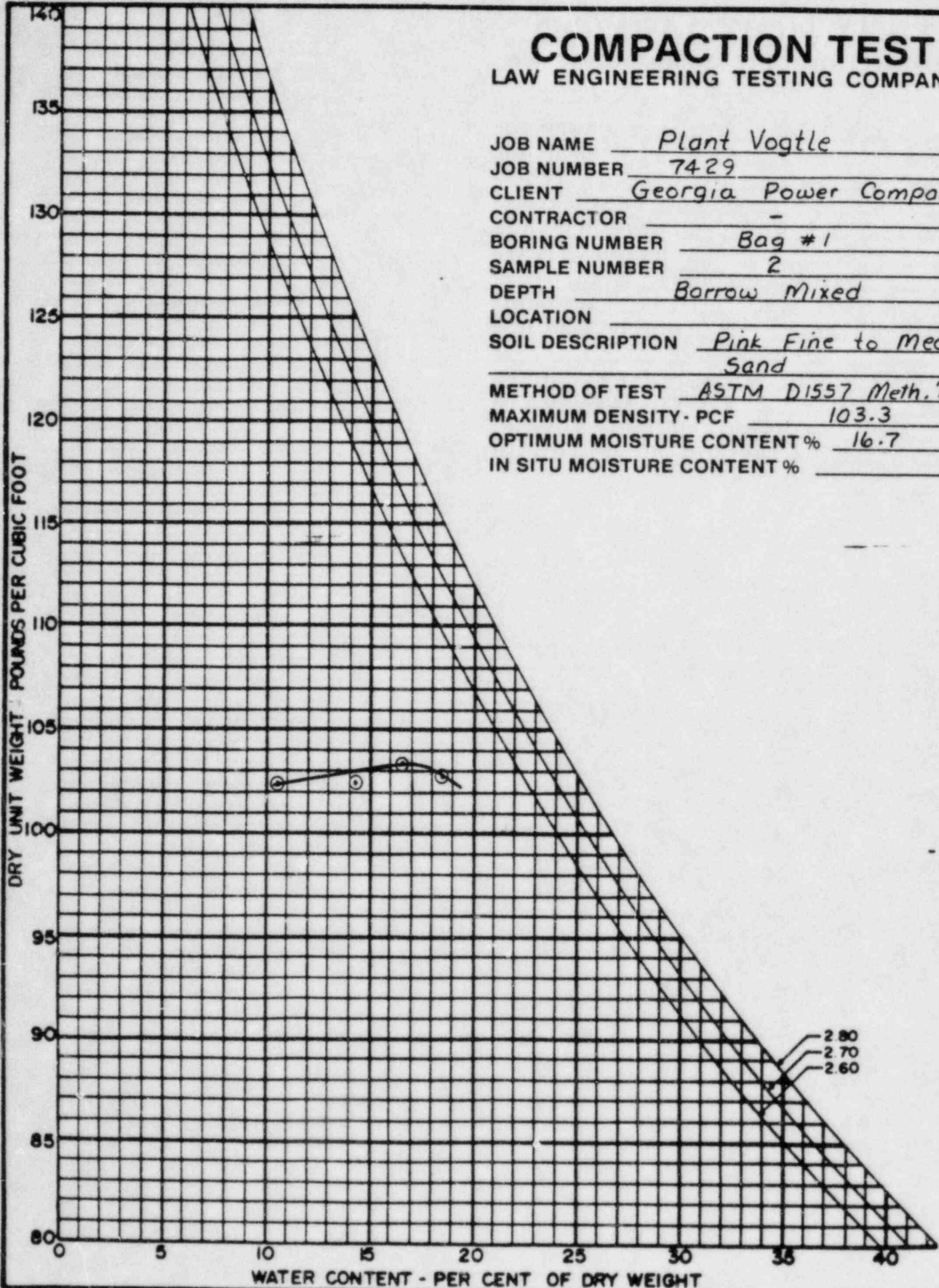


COMPACTION TEST

LAW ENGINEERING TESTING COMPANY.

JOB NAME Plant Vogtle
 JOB NUMBER 7429
 CLIENT Georgia Power Company
 CONTRACTOR -
 BORING NUMBER Bag #1
 SAMPLE NUMBER 2
 DEPTH Borrow Mixed
 LOCATION -
 SOIL DESCRIPTION Pink Fine to Med. Sand
 METHOD OF TEST ASTM D1557 Meth. "A"
 MAXIMUM DENSITY - PCF 103.3
 OPTIMUM MOISTURE CONTENT % 16.7
 IN SITU MOISTURE CONTENT % -

DRY UNIT WEIGHT - POUNDS PER CUBIC FOOT



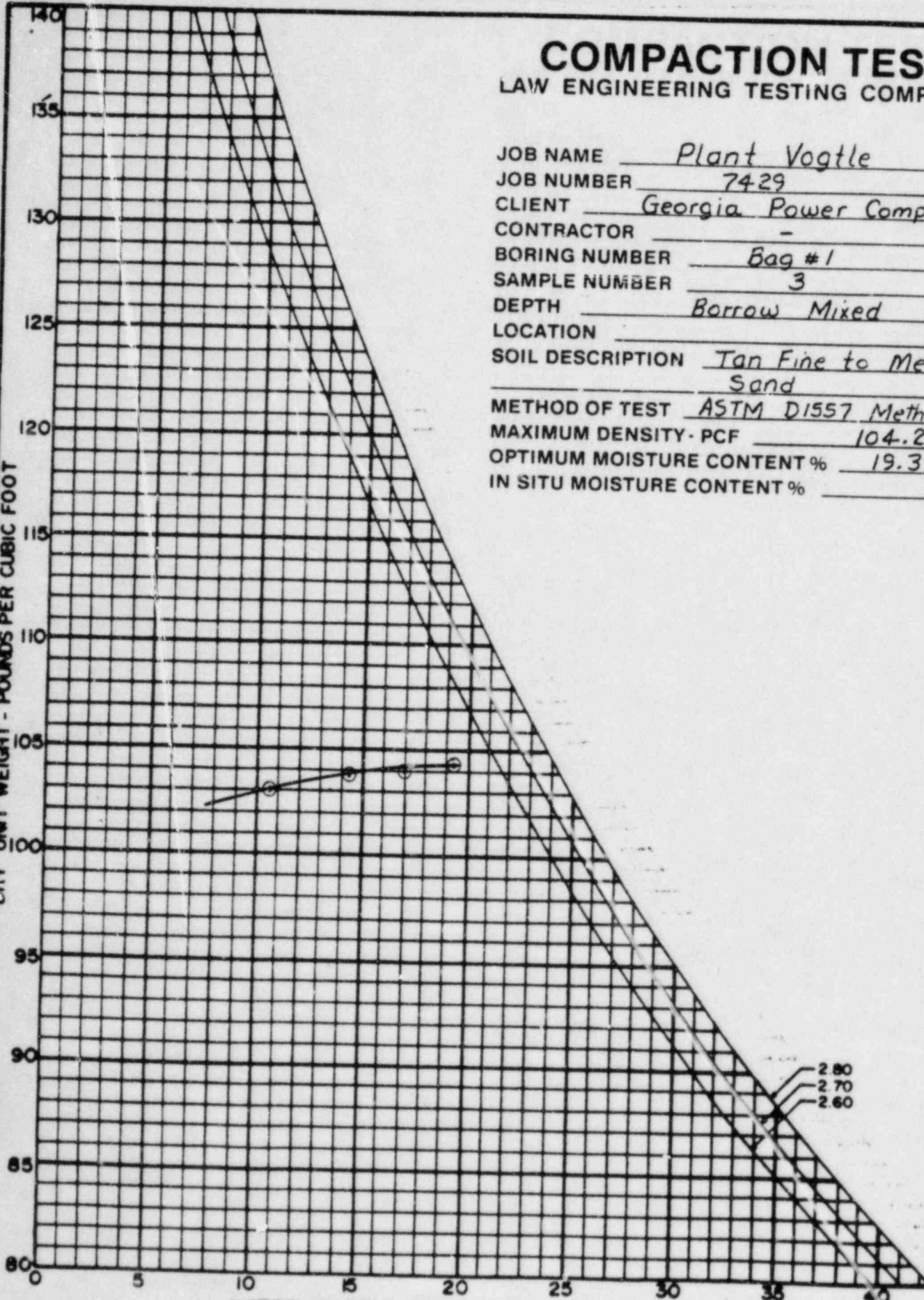
COMPACTION TEST

LAW ENGINEERING TESTING COMPANY.

JOB NAME Plant Vogtle
JOB NUMBER 7429
CLIENT Georgia Power Company
CONTRACTOR -
BORING NUMBER Bag #1
SAMPLE NUMBER 3
DEPTH Borrow Mixed
LOCATION -
SOIL DESCRIPTION Tan Fine to Med. Sand
METHOD OF TEST ASTM D1557 Meth. "A"
MAXIMUM DENSITY - PCF 104.2
OPTIMUM MOISTURE CONTENT % 19.3
IN SITU MOISTURE CONTENT % -

DRY UNIT WEIGHT - POUNDS PER CUBIC FOOT

WATER CONTENT - PER CENT OF DRY WEIGHT

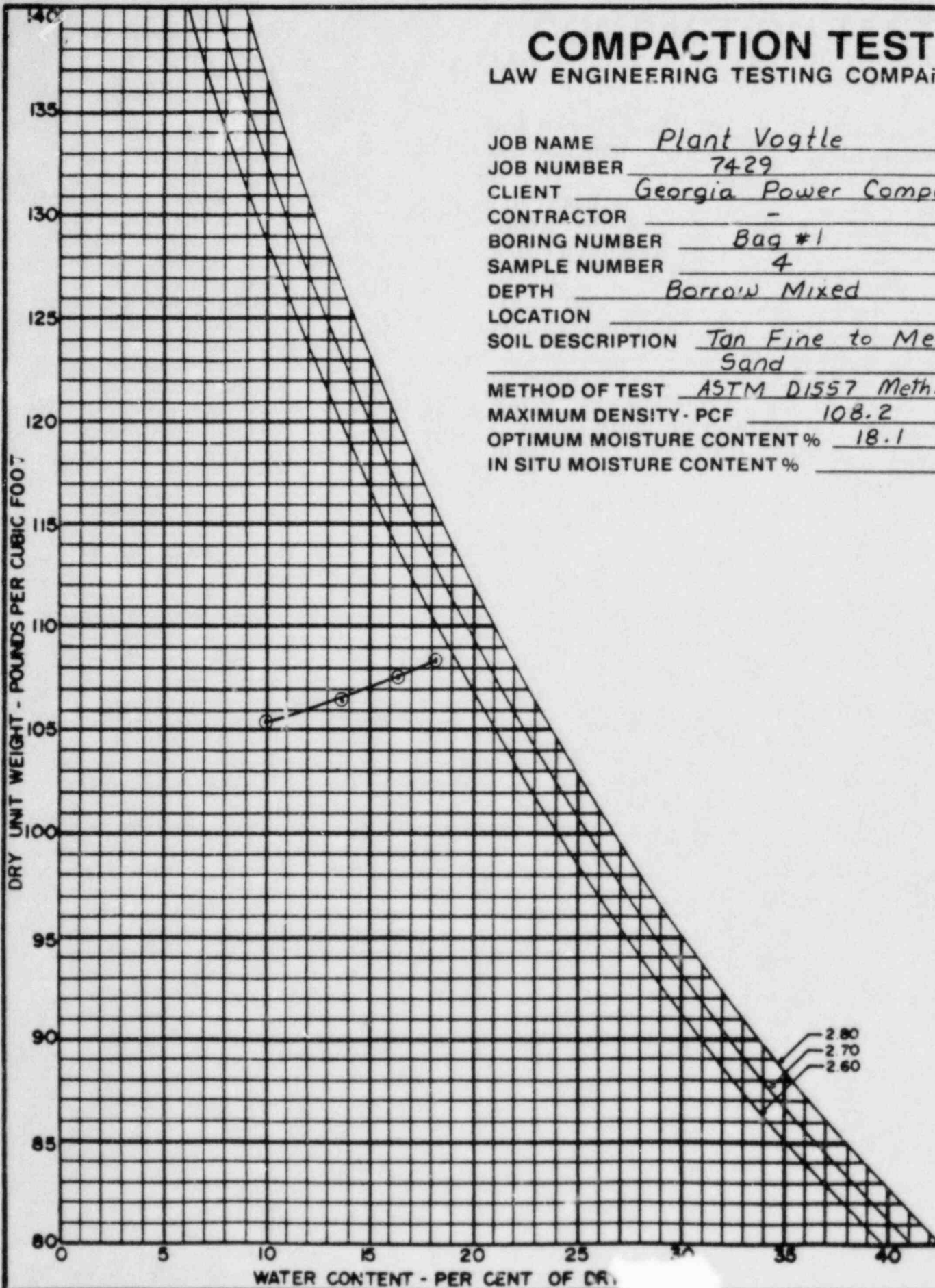


COMPACTION TEST

LAW ENGINEERING TESTING COMPANY.

JOB NAME Plant Vogtle
JOB NUMBER 7429
CLIENT Georgia Power Company
CONTRACTOR -
BORING NUMBER Bag #1
SAMPLE NUMBER 4
DEPTH Borrow Mixed
LOCATION _____
SOIL DESCRIPTION Tan Fine to Med.
Sand
METHOD OF TEST ASTM D1557 Meth. "A"
MAXIMUM DENSITY - PCF 108.2
OPTIMUM MOISTURE CONTENT % 18.1
IN SITU MOISTURE CONTENT % _____

DRY UNIT WEIGHT - POUNDS PER CUBIC FOOT

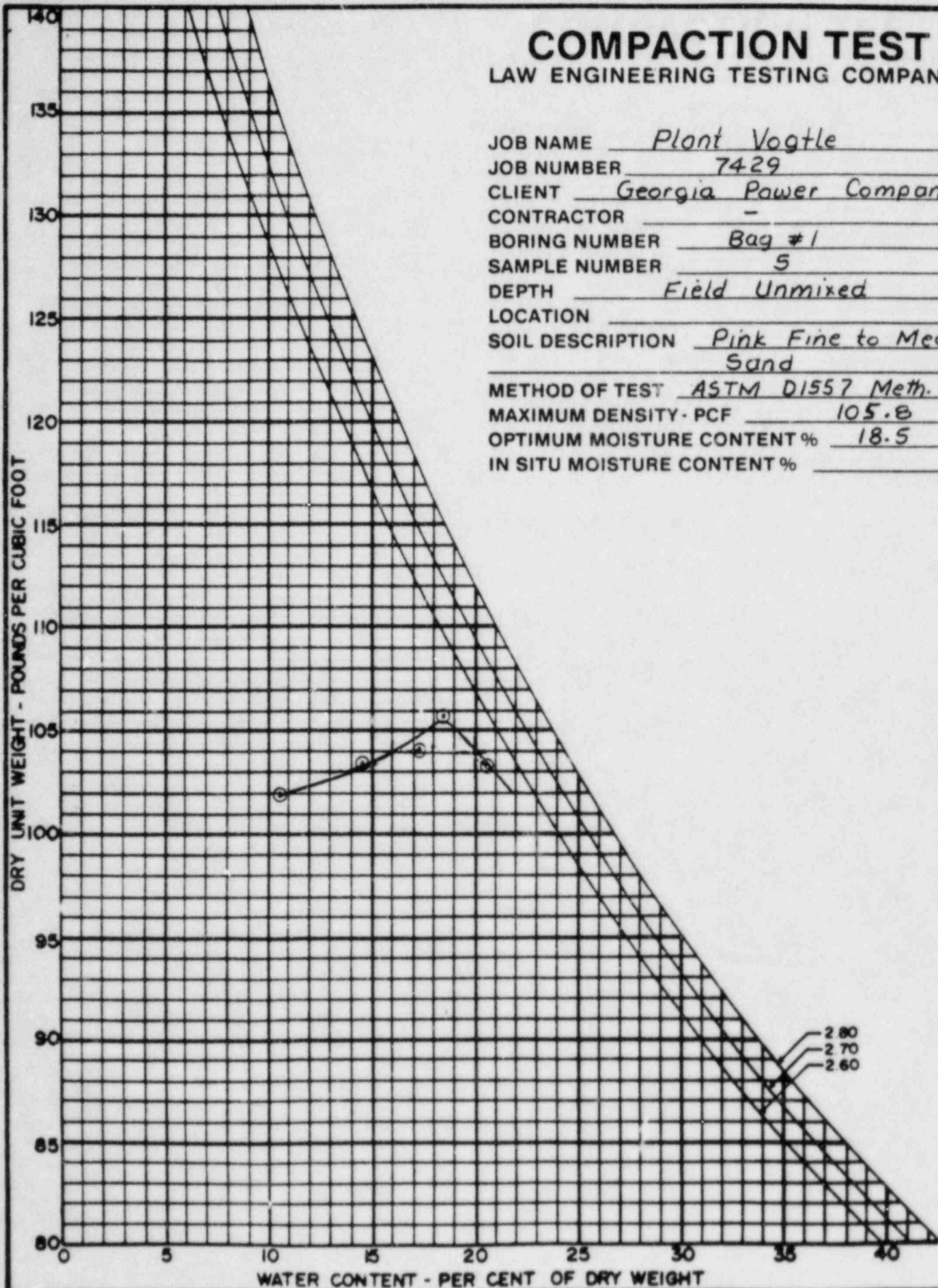


COMPACTION TEST

LAW ENGINEERING TESTING COMPANY.

JOB NAME Plant Vogtle
 JOB NUMBER 7429
 CLIENT Georgia Power Company
 CONTRACTOR -
 BORING NUMBER Bag #1
 SAMPLE NUMBER 5
 DEPTH Field Unmixed
 LOCATION _____
 SOIL DESCRIPTION Pink Fine to Med. Sand
 METHOD OF TEST ASTM D1557 Meth. "A"
 MAXIMUM DENSITY - PCF 105.8
 OPTIMUM MOISTURE CONTENT % 18.5
 IN SITU MOISTURE CONTENT % _____

DRY UNIT WEIGHT - POUNDS PER CUBIC FOOT

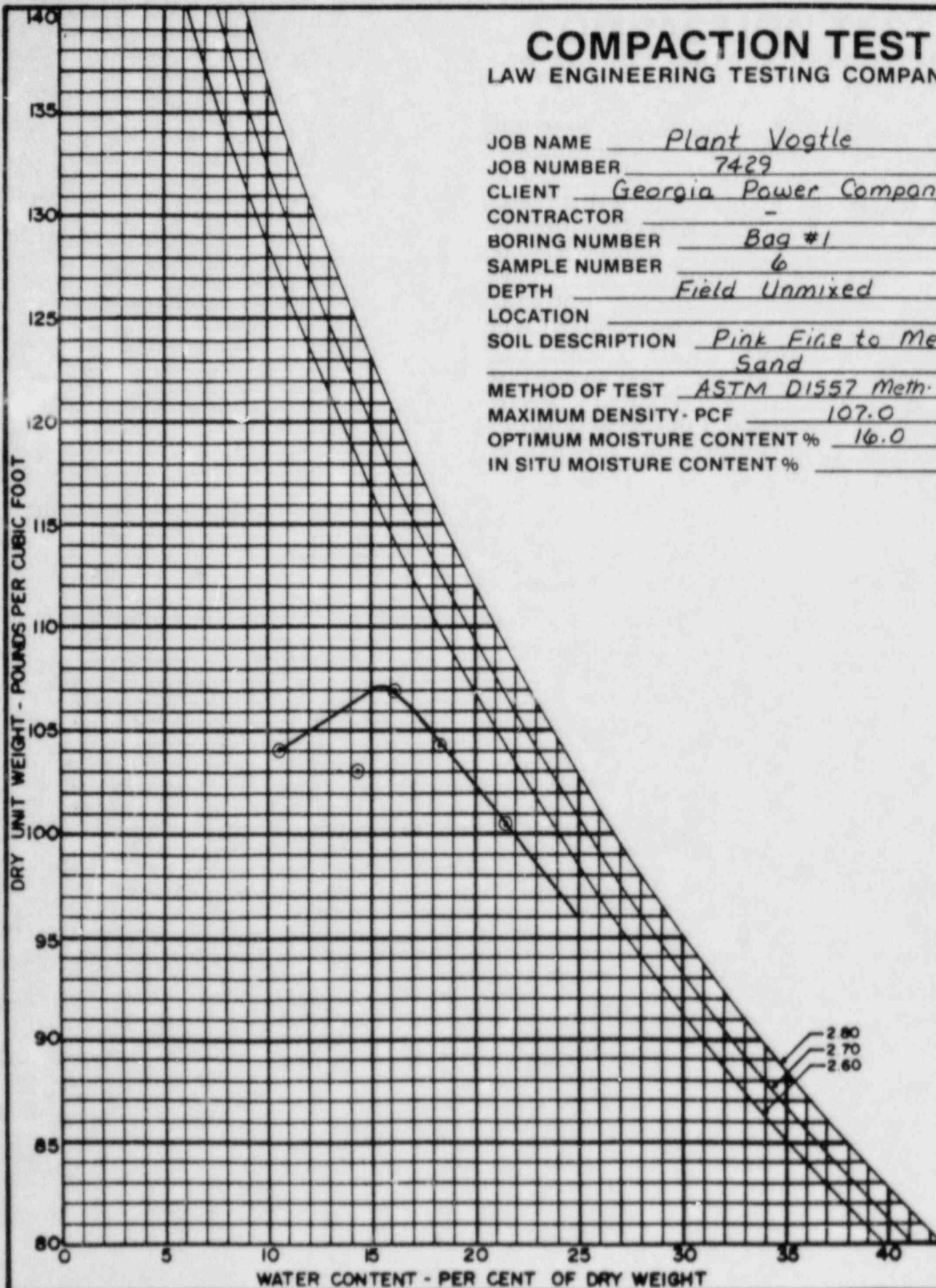


COMPACTION TEST

LAW ENGINEERING TESTING COMPANY.

JOB NAME Plant Vogtle
 JOB NUMBER 7429
 CLIENT Georgia Power Company
 CONTRACTOR -
 BORING NUMBER Bag #1
 SAMPLE NUMBER 6
 DEPTH Field Unmixed
 LOCATION _____
 SOIL DESCRIPTION Pink Fine to Med. Sand
 METHOD OF TEST ASTM D1557 Meth. "A"
 MAXIMUM DENSITY - PCF 107.0
 OPTIMUM MOISTURE CONTENT % 16.0
 IN SITU MOISTURE CONTENT % _____

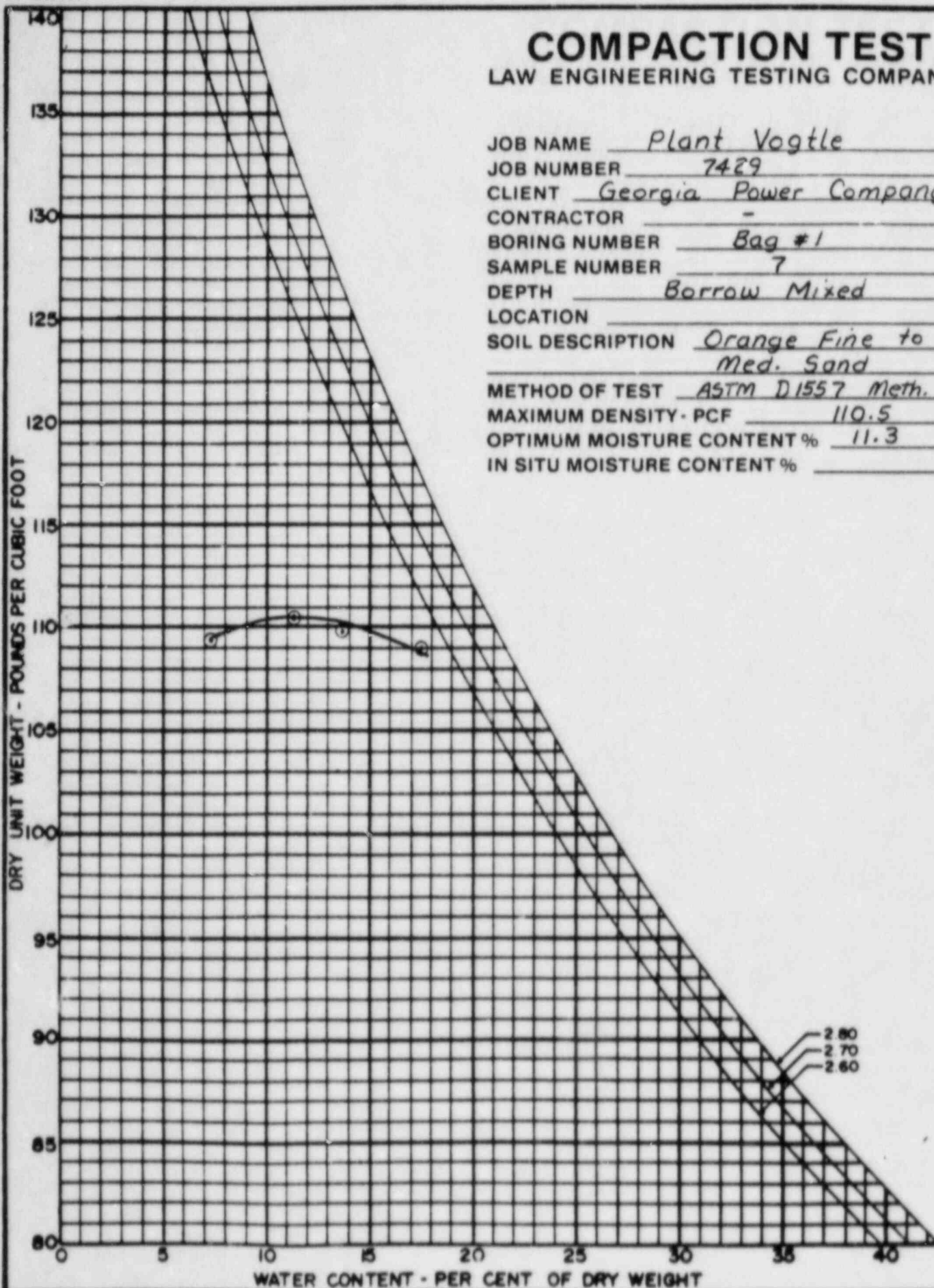
DRY UNIT WEIGHT - POUNDS PER CUBIC FOOT



COMPACTION TEST

LAW ENGINEERING TESTING COMPANY.

JOB NAME Plant Vogtle
 JOB NUMBER 7429
 CLIENT Georgia Power Company
 CONTRACTOR -
 BORING NUMBER Bag #1
 SAMPLE NUMBER 7
 DEPTH Borrow Mixed
 LOCATION _____
 SOIL DESCRIPTION Orange Fine to
Med. Sand
 METHOD OF TEST ASTM D1557 Meth. "A"
 MAXIMUM DENSITY - PCF 110.5
 OPTIMUM MOISTURE CONTENT % 11.3
 IN SITU MOISTURE CONTENT % _____

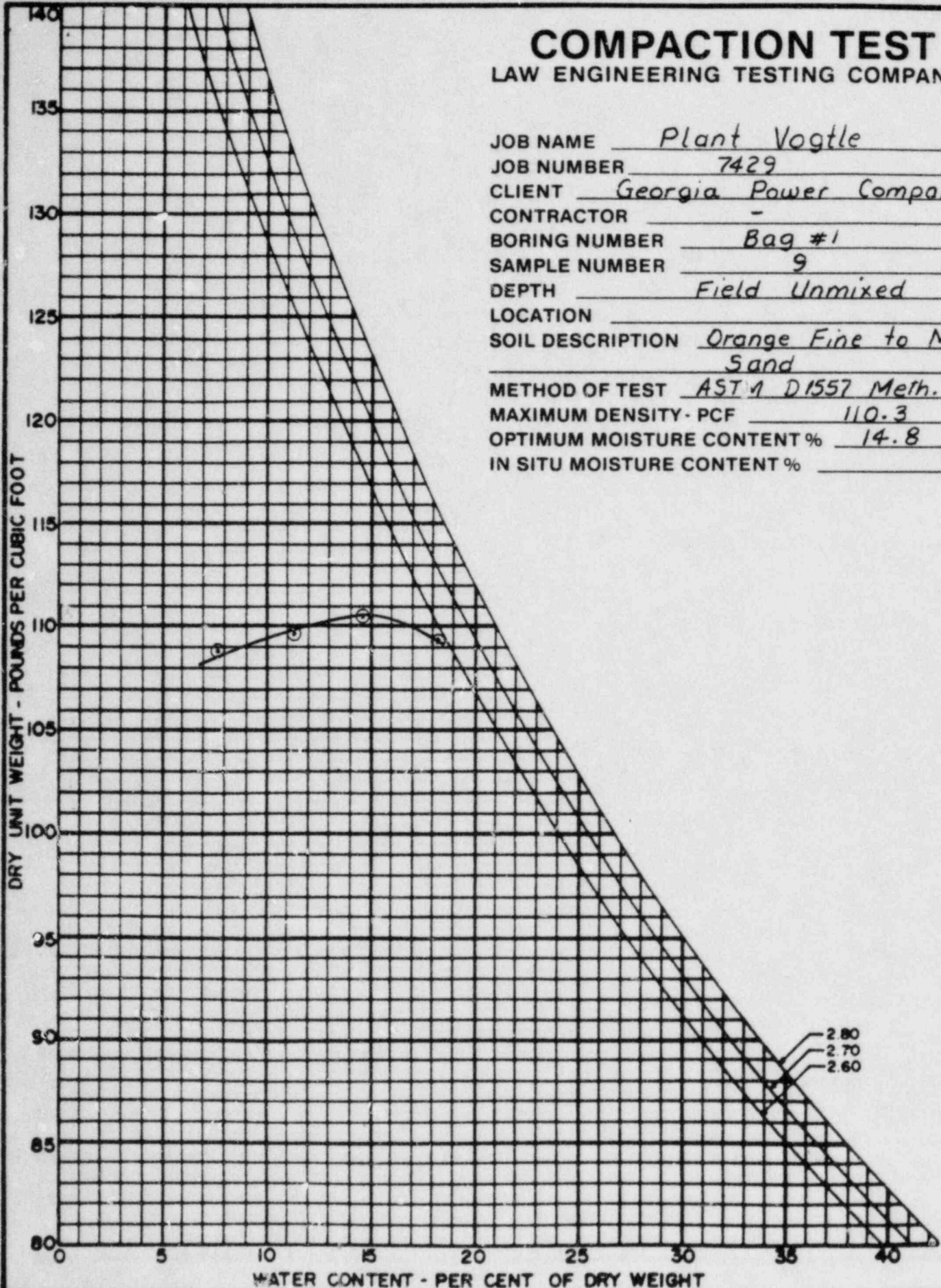


COMPACTION TEST

LAW ENGINEERING TESTING COMPANY.

JOB NAME Plant Vogtle
 JOB NUMBER 7429
 CLIENT Georgia Power Company
 CONTRACTOR -
 BORING NUMBER Bag #1
 SAMPLE NUMBER 9
 DEPTH Field Unmixed
 LOCATION -
 SOIL DESCRIPTION Orange Fine to Med. Sand
 METHOD OF TEST AST D 1557 Meth. A
 MAXIMUM DENSITY - PCF 110.3
 OPTIMUM MOISTURE CONTENT % 14.8
 IN SITU MOISTURE CONTENT % -

DRY UNIT WEIGHT - POUNDS PER CUBIC FOOT

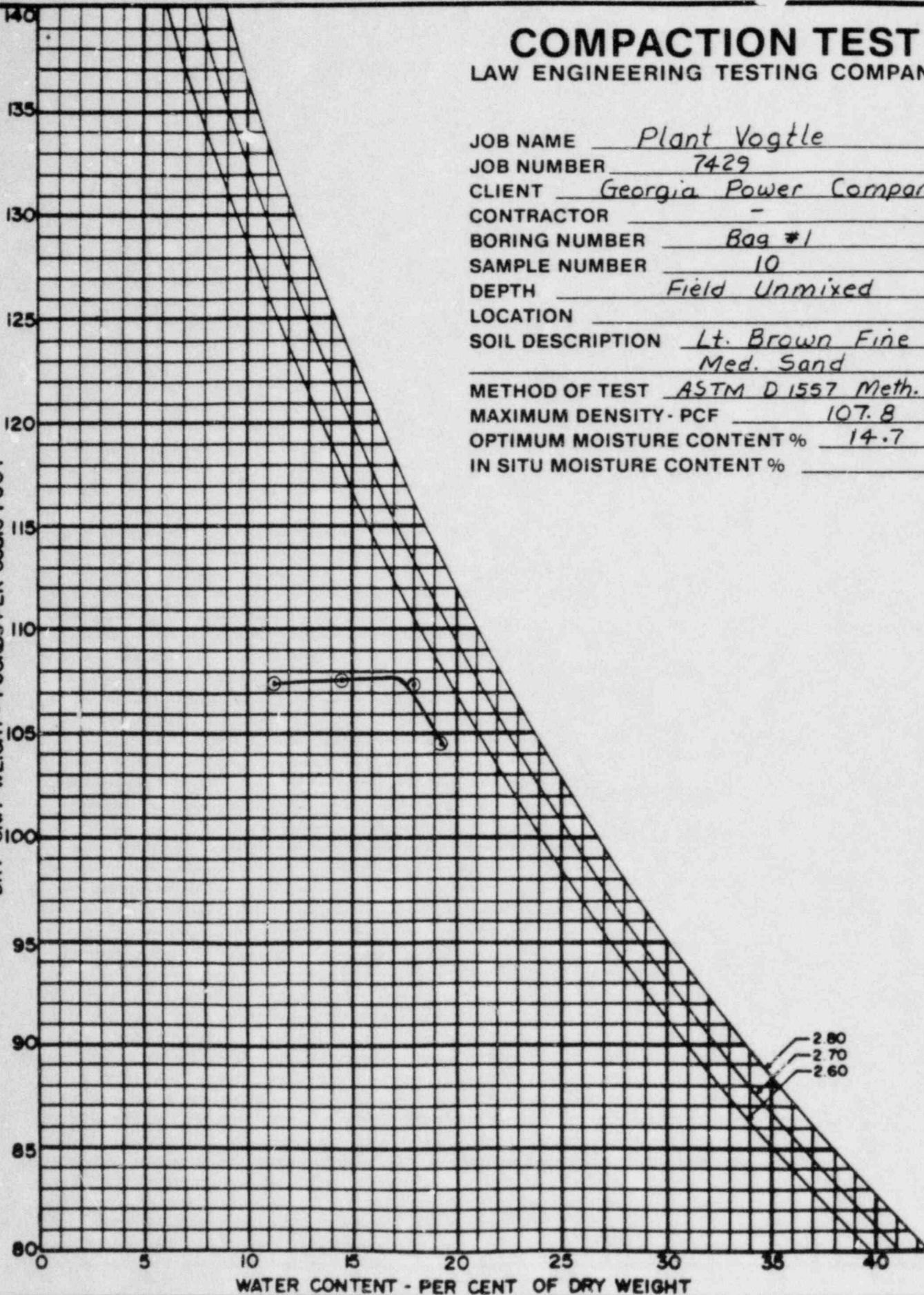


COMPACTION TEST

LAW ENGINEERING TESTING COMPANY.

JOB NAME Plant Vogtle
 JOB NUMBER 7429
 CLIENT Georgia Power Company
 CONTRACTOR -
 BORING NUMBER Bag #1
 SAMPLE NUMBER 10
 DEPTH Field Unmixed
 LOCATION -
 SOIL DESCRIPTION Lt. Brown Fine to Med. Sand
 METHOD OF TEST ASTM D 1557 Meth. "A"
 MAXIMUM DENSITY - PCF 107.8
 OPTIMUM MOISTURE CONTENT % 14.7
 IN SITU MOISTURE CONTENT % -

DRY UNIT WEIGHT - POUNDS PER CUBIC FOOT

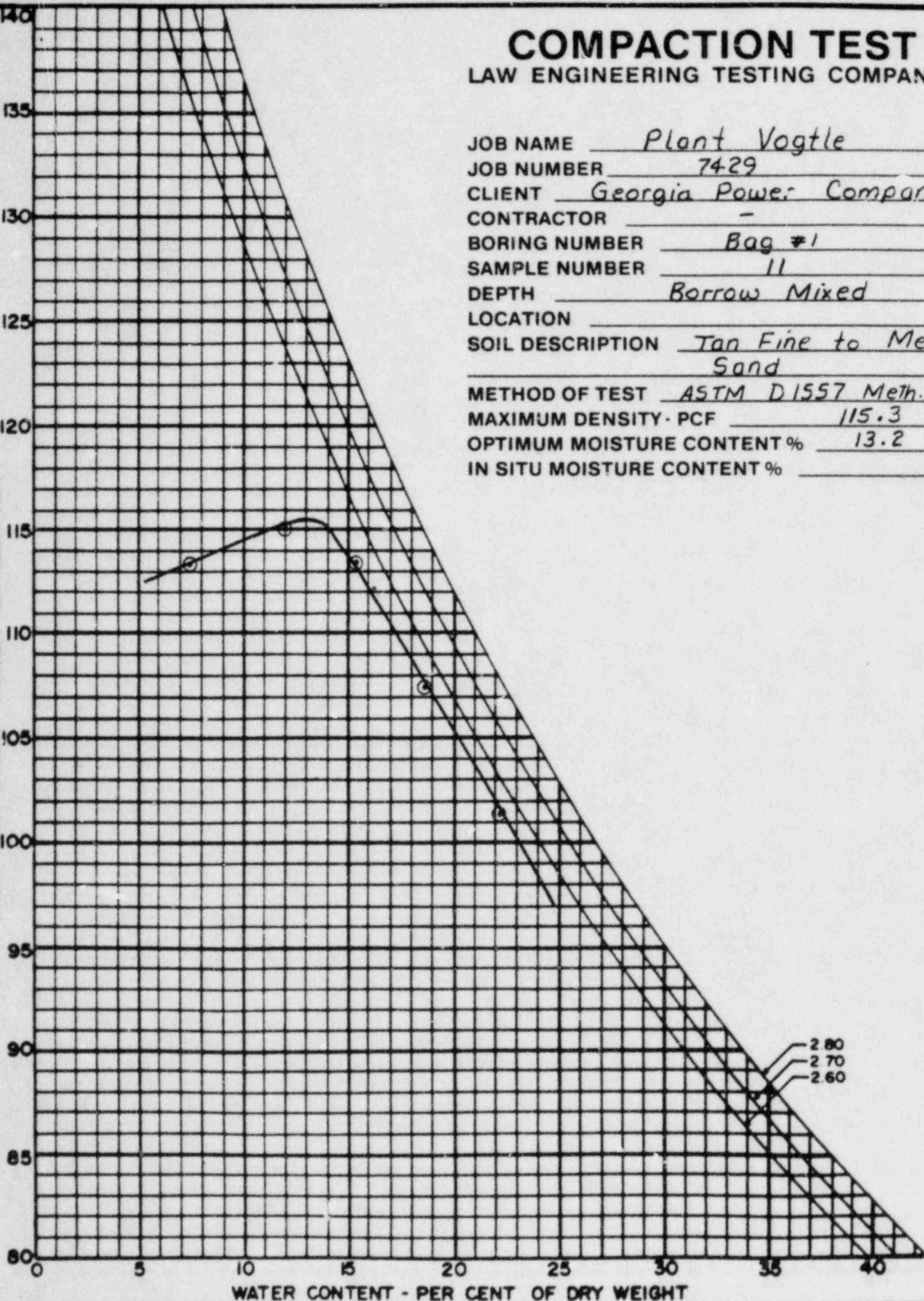


COMPACTION TEST

LAW ENGINEERING TESTING COMPANY.

JOB NAME Plant Vogtle
 JOB NUMBER 7429
 CLIENT Georgia Power Company
 CONTRACTOR -
 BORING NUMBER Bag #1
 SAMPLE NUMBER 11
 DEPTH Borrow Mixed
 LOCATION -
 SOIL DESCRIPTION Tan Fine to Med. Sand
 METHOD OF TEST ASTM D1557 Meth. "A"
 MAXIMUM DENSITY - PCF 115.3
 OPTIMUM MOISTURE CONTENT % 13.2
 IN SITU MOISTURE CONTENT % -

DRY UNIT WEIGHT - POUNDS PER CUBIC FOOT



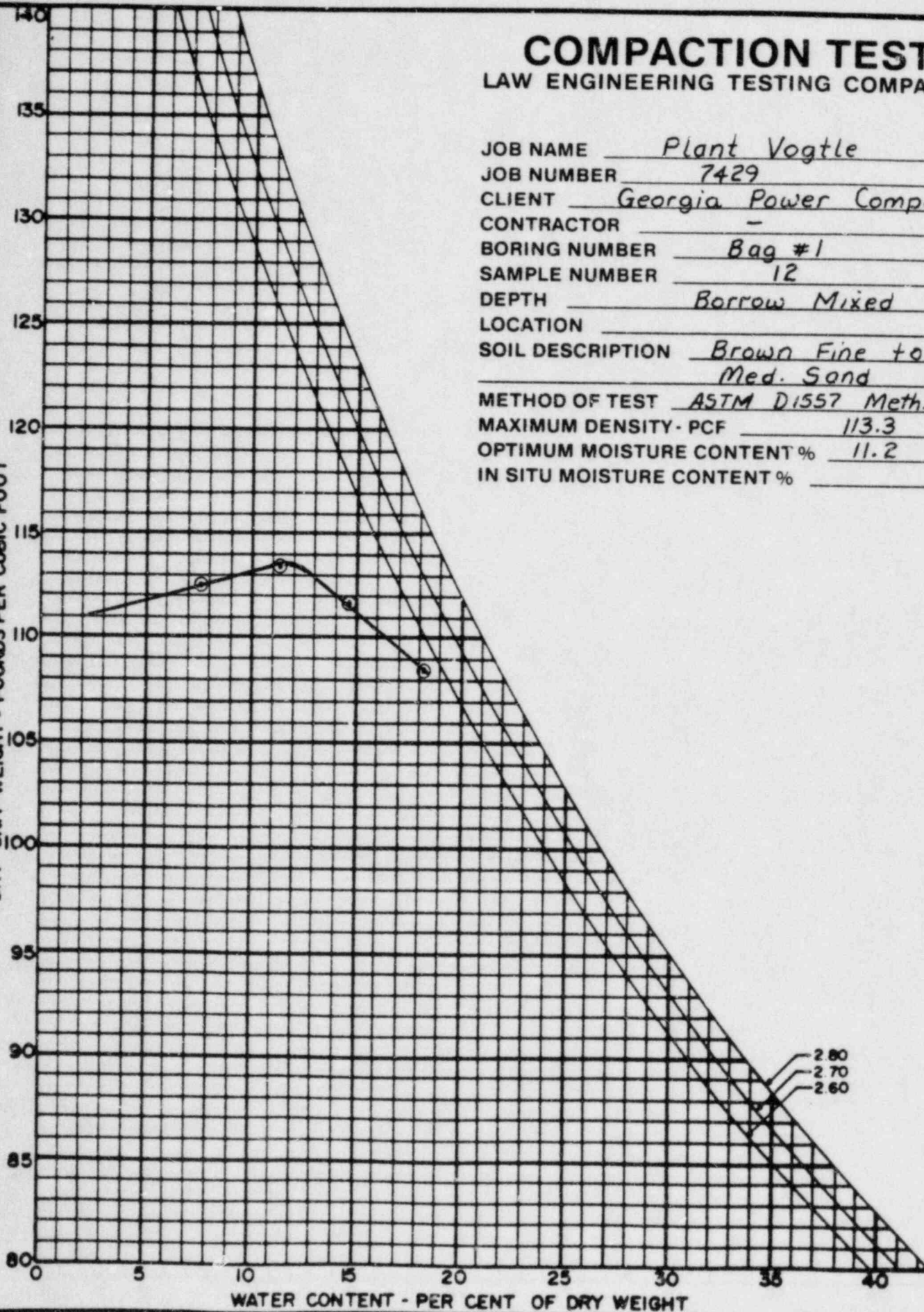
WATER CONTENT - PER CENT OF DRY WEIGHT

COMPACTION TEST

LAW ENGINEERING TESTING COMPANY.

JOB NAME Plant Vogtle
 JOB NUMBER 7429
 CLIENT Georgia Power Company
 CONTRACTOR -
 BORING NUMBER Bag #1
 SAMPLE NUMBER 12
 DEPTH Borrow Mixed
 LOCATION -
 SOIL DESCRIPTION Brown Fine to Med. Sand
 METHOD OF TEST ASTM D1557 Meth. "A"
 MAXIMUM DENSITY - PCF 113.3
 OPTIMUM MOISTURE CONTENT % 11.2
 IN SITU MOISTURE CONTENT % -

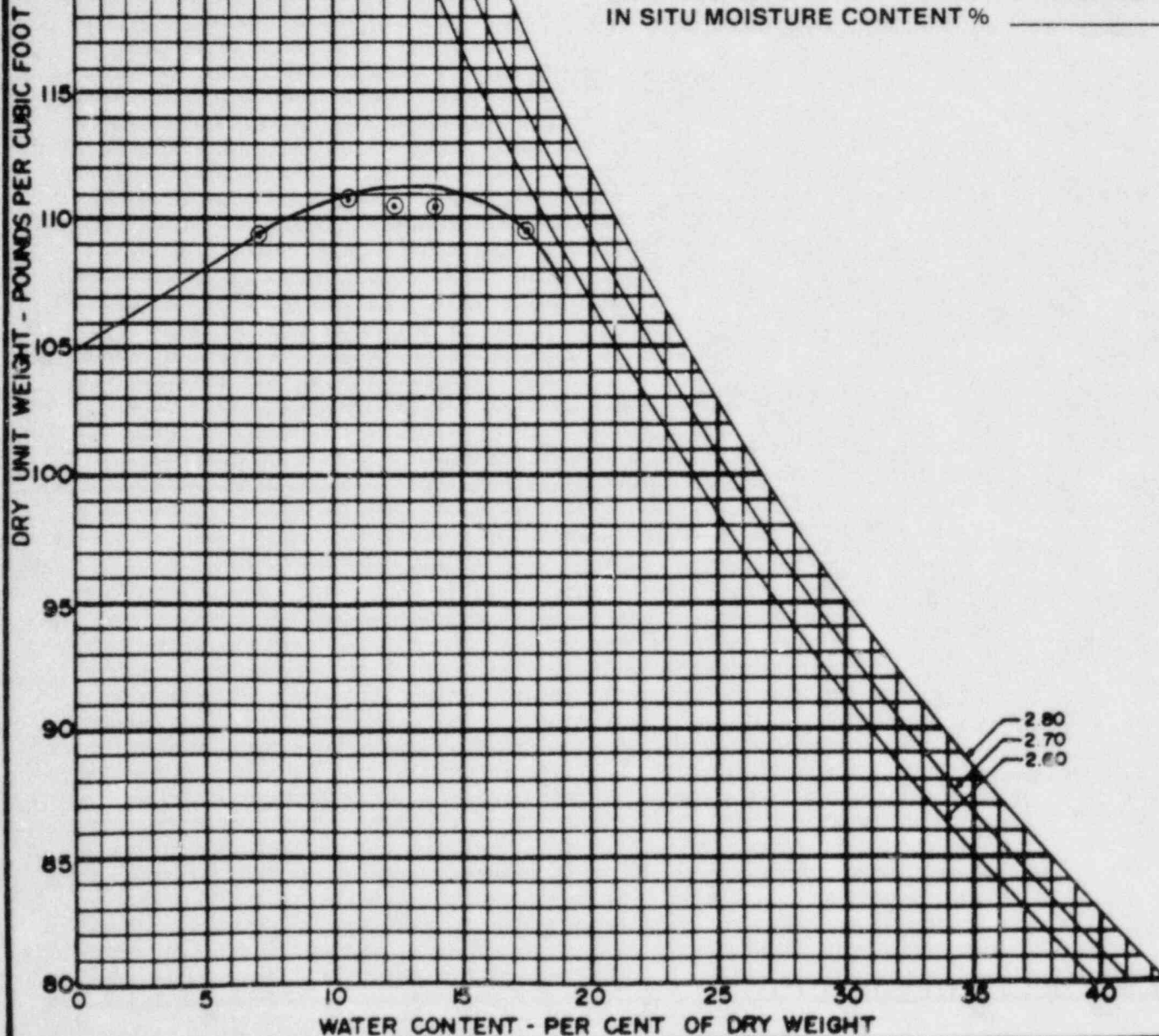
DRY UNIT WEIGHT - POUNDS PER CUBIC FOOT



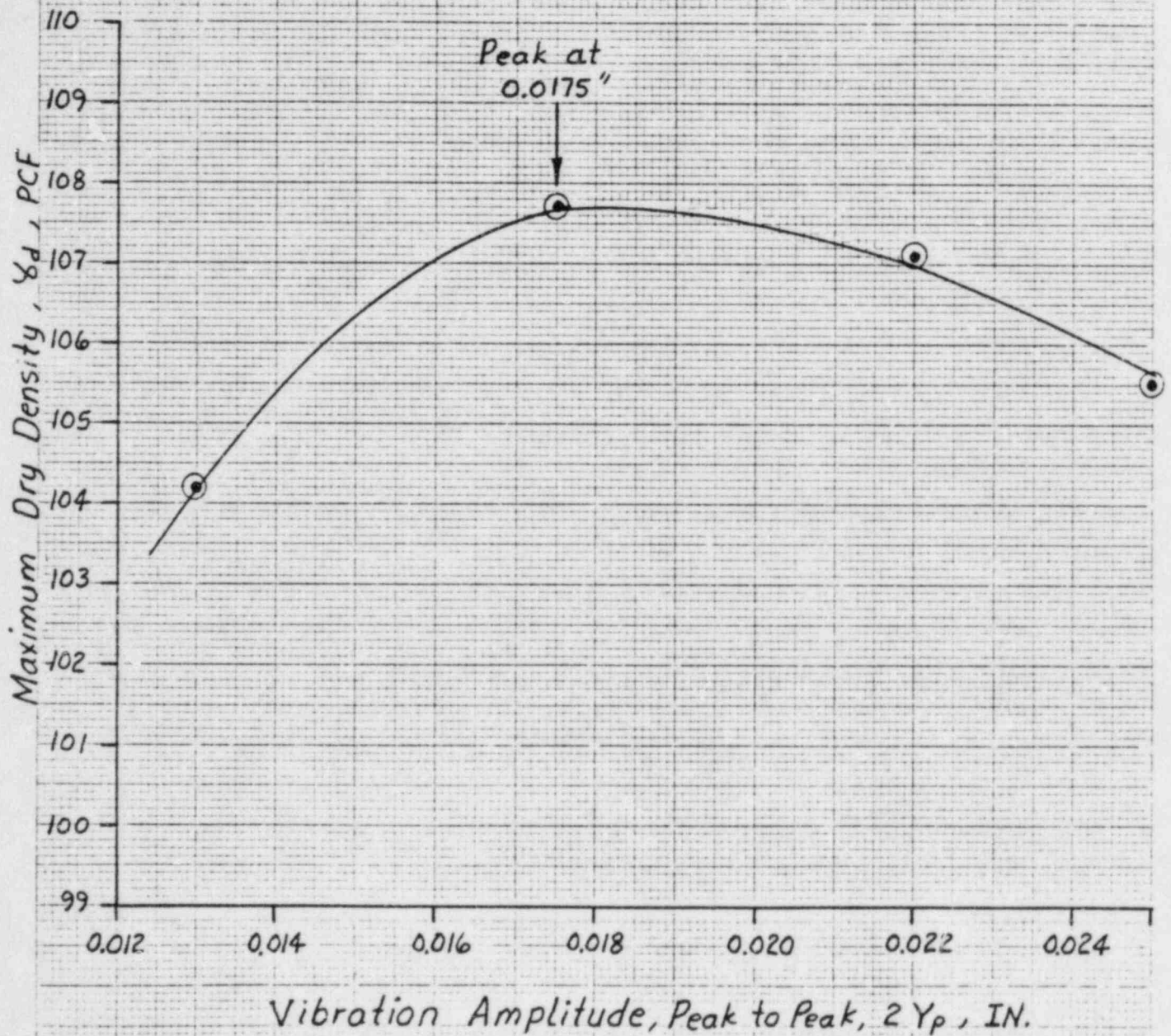
COMPACTION TEST

LAW ENGINEERING TESTING COMPANY.

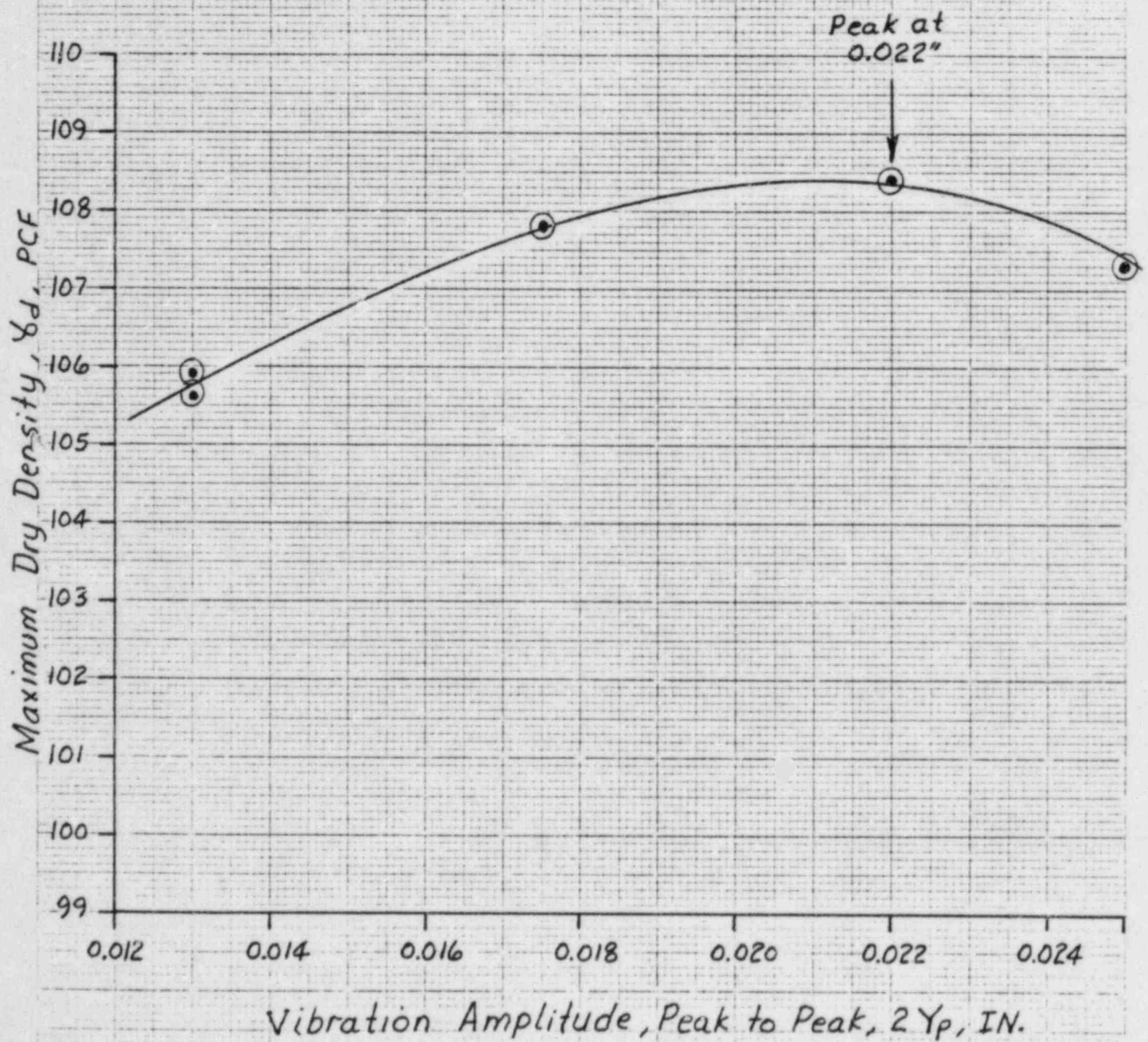
JOB NAME Plant Vogtle
 JOB NUMBER 7429
 CLIENT Georgia Power Company
 CONTRACTOR -
 BORING NUMBER Bag #1
 SAMPLE NUMBER 13
 DEPTH Field Unmixed
 LOCATION -
 SOIL DESCRIPTION Orange Fine to Med. Sand
 METHOD OF TEST ASTM D1557 Meth. "A"
 MAXIMUM DENSITY - PCF 111.2
 OPTIMUM MOISTURE CONTENT % 13.5
 IN SITU MOISTURE CONTENT % -



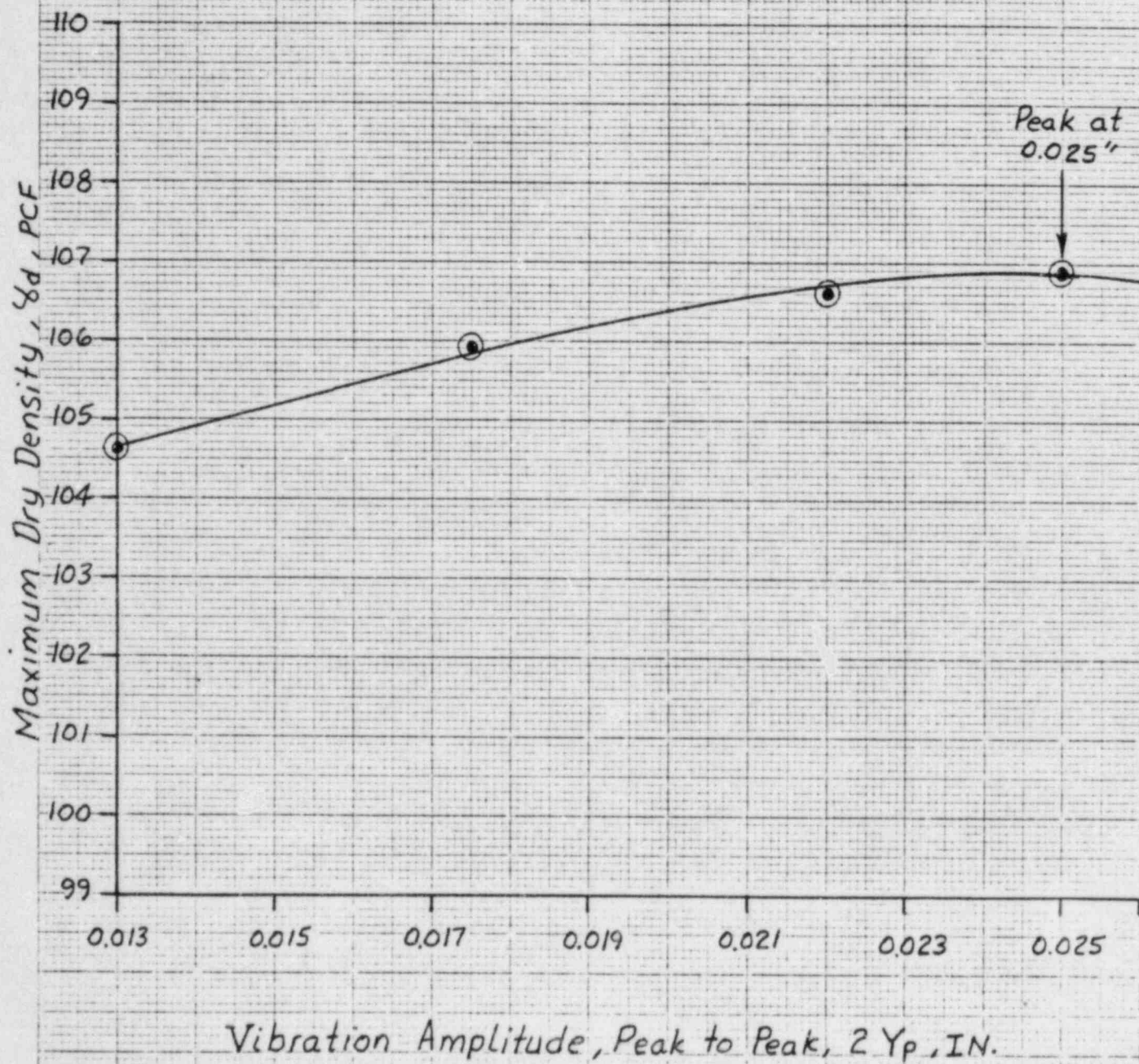
Plant Vogtle
7429
Bag 1, Sample #5



Plant Vogtle
7429
Bag 1, Sample #7



Plant Vogtle
7477
Bag 1, Sample #11



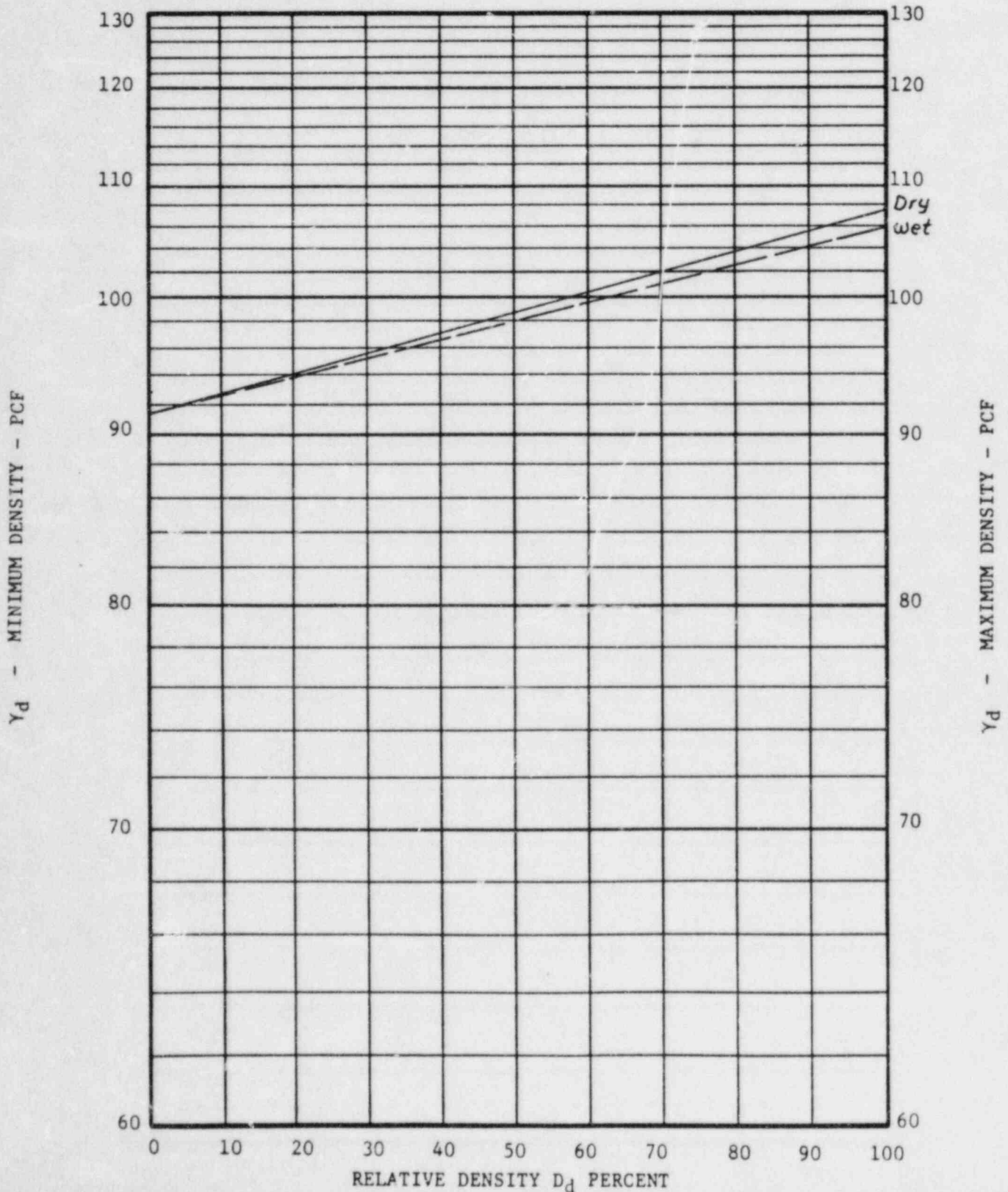
RELATIVE DENSITY TEST

DATE 7-30-84
 JOB NAME Plant Vogtle
 JOB NUMBER 7429
 BORING NUMBER Bag #1
 SAMPLE NUMBER 1
 DEPTH (FT.) _____
 MOLD SIZE 1/10 ft. 3
 METHOD-MINIMUM DENSITY Funnel
 (FUNNEL OR SCOOP)
 METHOD-MAXIMUM DENSITY Dry & Wet
 (DRY OR WET)

γ_d (max)(wet) 105.9 e (min) _____
 γ_d (max)(dry) 107.5 e (min) _____
 γ_d (min) 91.4 e (max) _____
 γ_d _____ e _____
 D_d _____

Specific Gravity 2.63

Vib. Amplitude - 0.0175"



RELATIVE DENSITY TEST

DATE 7-30-84

JOB NAME Plant Vogtle

JOB NUMBER 7429

BORING NUMBER Bag #1

SAMPLE NUMBER 2

DEPTH (FT.) _____

MOLD SIZE 1/10 ft.³

METHOD-MINIMUM DENSITY Funnel

(FUNNEL OR SCOOP)

METHOD-MAXIMUM DENSITY Dry & wet

(DRY OR WET)

γ_d (max)(wet) 104.2 e (min) _____

γ_d (max)(dry) 105.8 e (min) _____

γ_d (min) 86.0 e (max) _____

γ_d _____ e _____

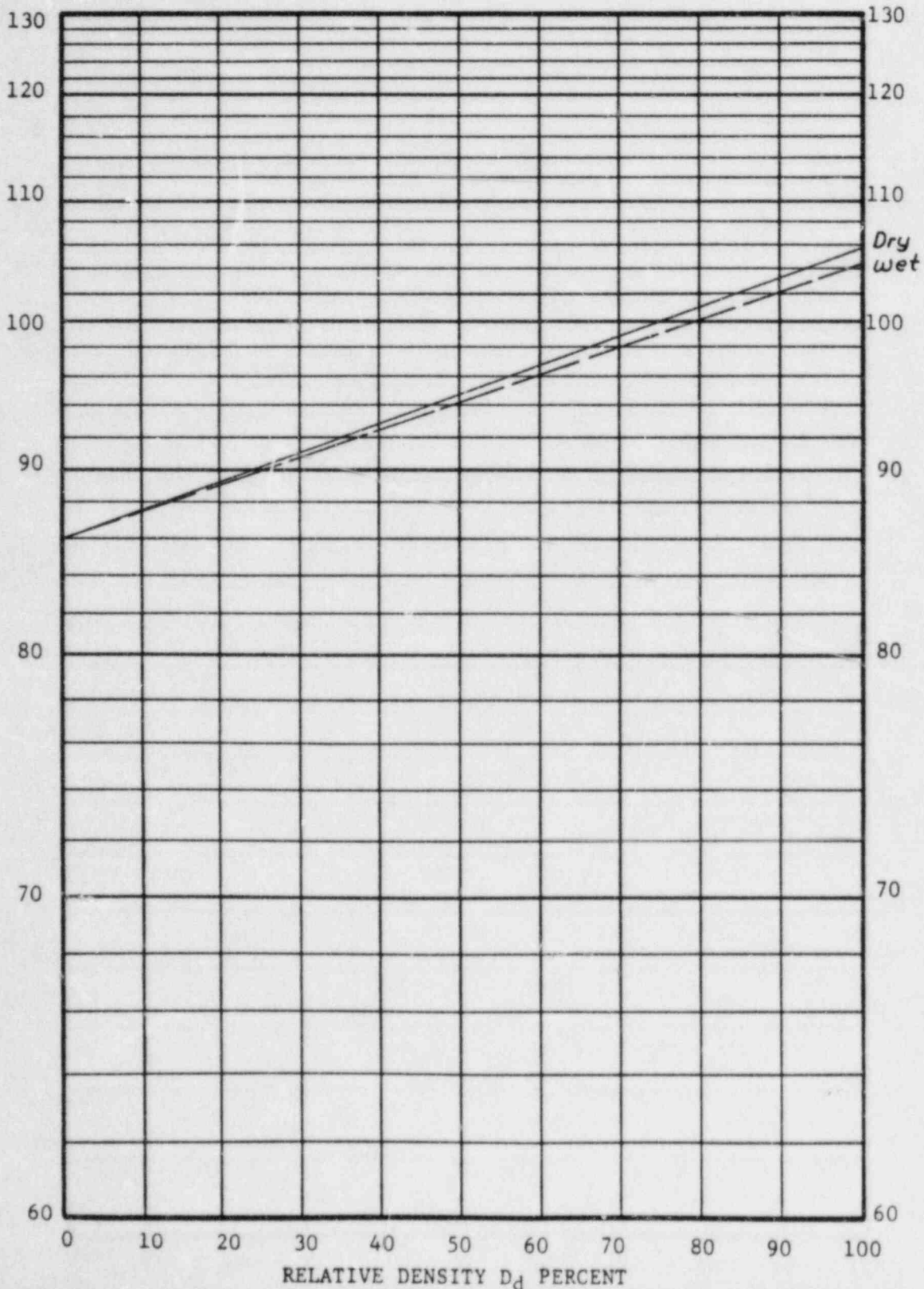
D_d _____

Specific Gravity 2.67

Vib. Amplitude - 0.0175"

γ_d - MINIMUM DENSITY - PCF

γ_d - MAXIMUM DENSITY - PCF



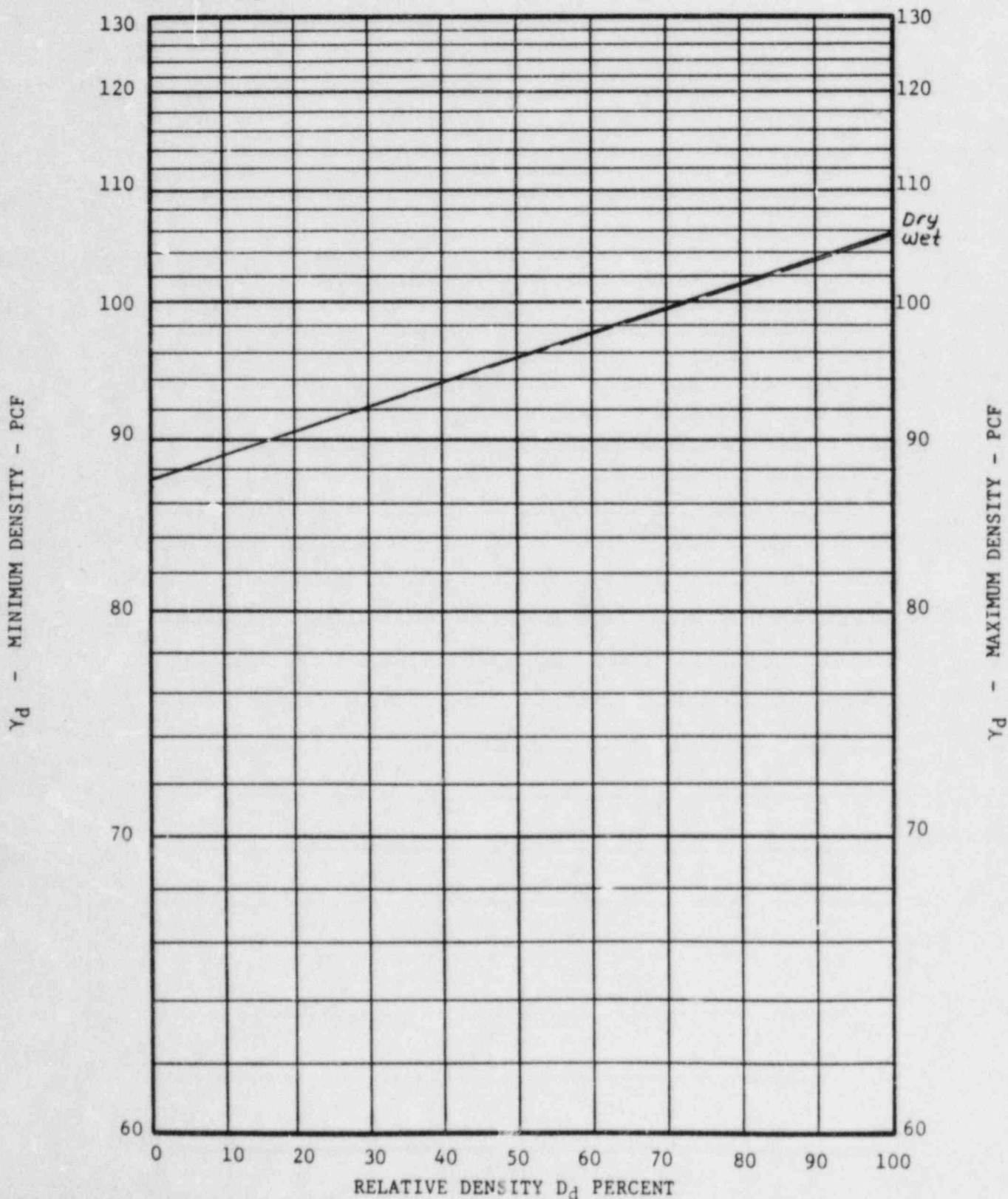
RELATIVE DENSITY TEST

DATE 7-31-84
 JOB NAME Plant Vogtle
 JOB NUMBER 7429
 BORING NUMBER Bag #1
 SAMPLE NUMBER 3
 DEPTH (FT.) _____
 MOLD SIZE 1/10 ft.³
 METHOD-MINIMUM DENSITY Funnel
 (FUNNEL OR SCOOP)
 METHOD-MAXIMUM DENSITY Dry & Wet
 (DRY OR WET)

γ_d (max)(wet) 105.8 e (min) _____
 γ_d (max)(dry) 105.9 e (min) _____
 γ_d (min) 87.3 e (max) _____
 γ_d _____ e _____
 D_d _____

Specific Gravity 2.66

Vib. Amplitude - 0.0175 "



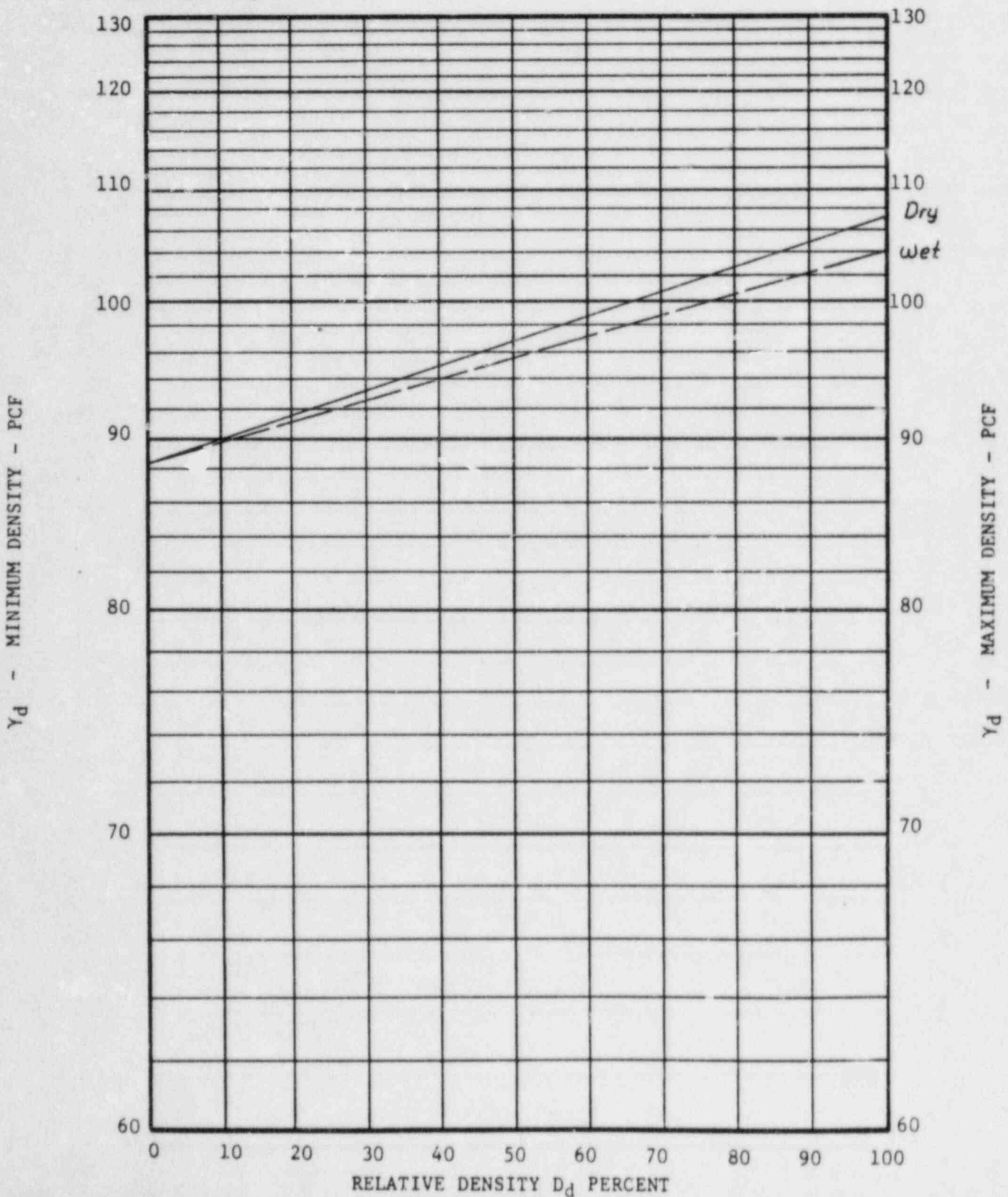
RELATIVE DENSITY TEST

DATE 7-31-84
 JOB NAME Plant Vogtle
 JOB NUMBER 7429
 BORING NUMBER Bag #1
 SAMPLE NUMBER 4
 DEPTH (FT.) _____
 MOLD SIZE 1/10 ft.³
 METHOD-MINIMUM DENSITY Funnel
 (FUNNEL OR SCOOP)
 METHOD-MAXIMUM DENSITY Dry & Wet
 (DRY OR WET)

γ_d (max)(wet) 104.0 e (min) _____
 γ_d (max)(dry) 107.1 e (min) _____
 γ_d (min) 88.3 e (max) _____
 γ_d _____ e _____
 D_d _____

Specific Gravity 2.68

Vib. Amplitude - 0.0175 "

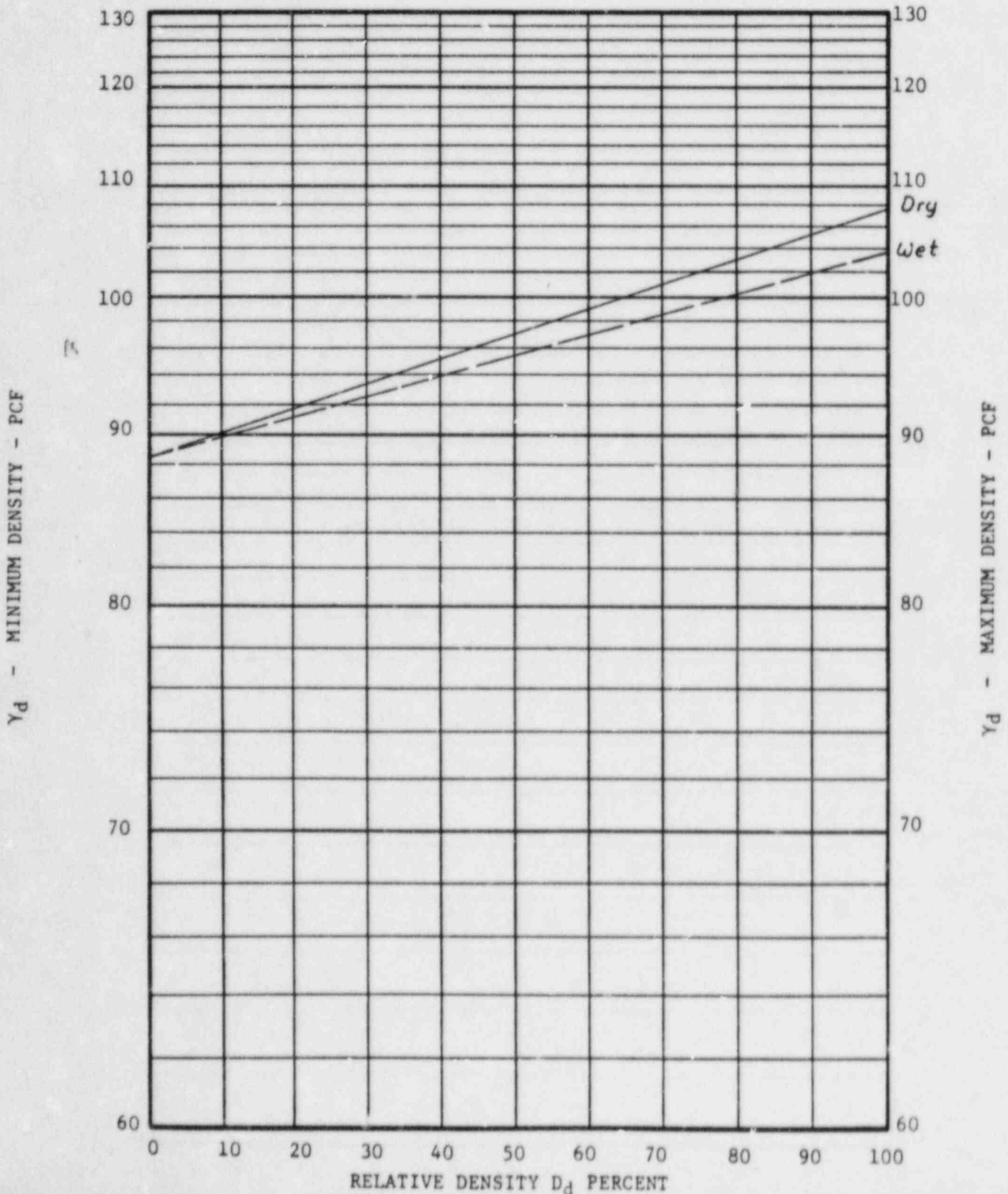


RELATIVE DENSITY TEST

DATE 7-31-84
 JOB NAME Plant Vogtle
 JOB NUMBER 7429
 BORING NUMBER Bag #1
 SAMPLE NUMBER 5
 DEPTH (FT.) _____
 MOLD SIZE 1/10 ft.³
 METHOD-MINIMUM DENSITY Funnel
 (FUNNEL OR SCOOP)
 METHOD-MAXIMUM DENSITY Dry & wet
 (DRY OR WET)

γ_d (max) (wet) 103.8 e (min) _____
 γ_d (max) (dry) 102.7 e (min) _____
 γ_d (min) 88.6 e (max) _____
 γ_d _____ e _____
 D_d _____

Specific Gravity 2.67
 Vib. Amplitude - 0.0175"



RELATIVE DENSITY TEST

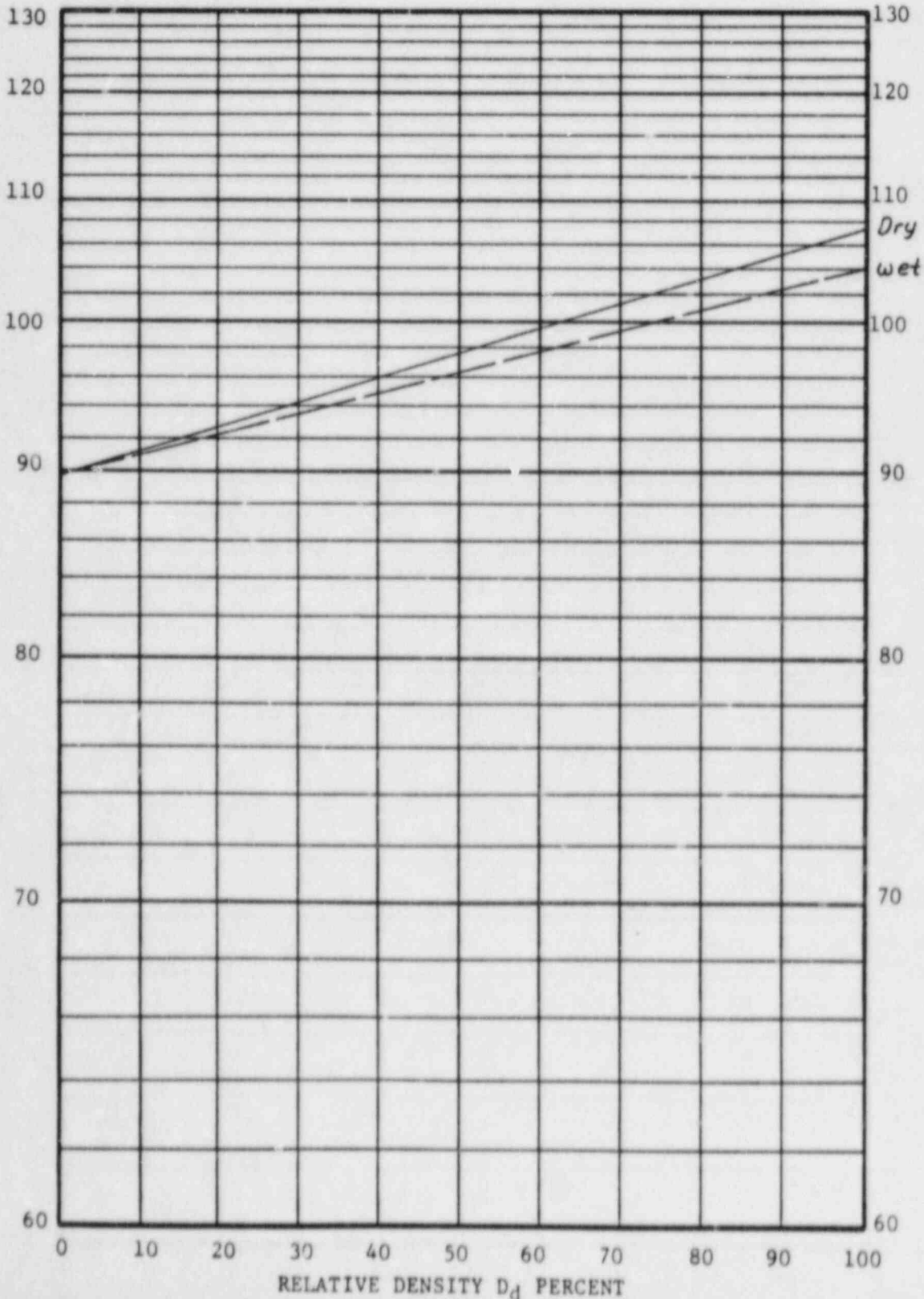
DATE 7-31-84
 JOB NAME Plant Vogtle
 JOB NUMBER 7429
 BORING NUMBER Bag #1
 SAMPLE NUMBER 6
 DEPTH (FT.) _____
 MOLD SIZE 1/10 ft.³
 METHOD-MINIMUM DENSITY Funnel
 (FUNNEL OR SCOOP)
 METHOD-MAXIMUM DENSITY Dry & Wet
 (DRY OR WET)

γ_d (max)(wet) 104.0 e (min) _____
 γ_d (max)(dry) 107.3 e (min) _____
 γ_d (min) 89.9 e (max) _____
 γ_d _____ e _____
 D_d _____

Specific Gravity 2.67

Vib. Amplitude - 0.0175"

γ_d - MINIMUM DENSITY - PCF



γ_d - MAXIMUM DENSITY - PCF

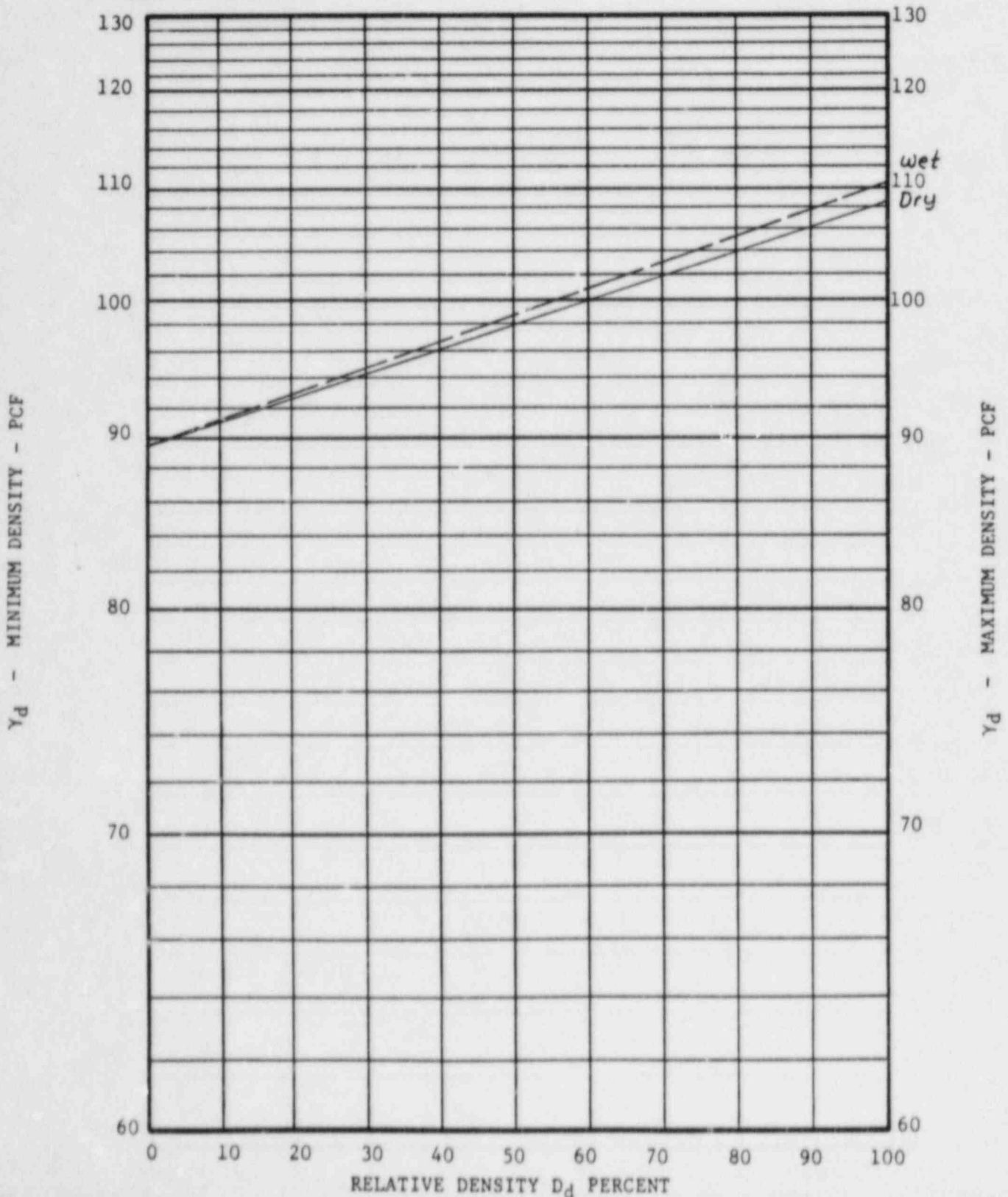
RELATIVE DENSITY TEST

DATE 7-31-84
 JOB NAME Plant Vogtle
 JOB NUMBER 7429
 BORING NUMBER Bag #1
 SAMPLE NUMBER 7
 DEPTH (FT.) _____
 MOLD SIZE 1/10 ft.³
 METHOD-MINIMUM DENSITY Funnel
 (FUNNEL OR SCOOP)
 METHOD-MAXIMUM DENSITY Dry & Wet
 (DRY OR WET)

γ_d (max) (wet) 110.2 e (min) _____
 γ_d (max) (dry) 108.4 e (min) _____
 γ_d (min) 89.7 e (max) _____
 γ_d _____ e _____
 D_d _____

Specific Gravity 2.64

Vib. Amplitude - 0.022"



RELATIVE DENSITY TEST

DATE 7-31-84

JOB NAME Plant Vogtle

JOB NUMBER 7429

BORING NUMBER Bag #1

SAMPLE NUMBER 9

DEPTH (FT.) _____

MOLD SIZE 1/10 ft.³

METHOD-MINIMUM DENSITY Funnel

(FUNNEL OR SCOOP)

METHOD-MAXIMUM DENSITY Dry & wet

(DRY OR WET)

Y_d (max) (wet) 107.0 e (min) _____

Y_d (max) (dry) 101.7 e (min) _____

Y_d (min) 82.9 e (max) _____

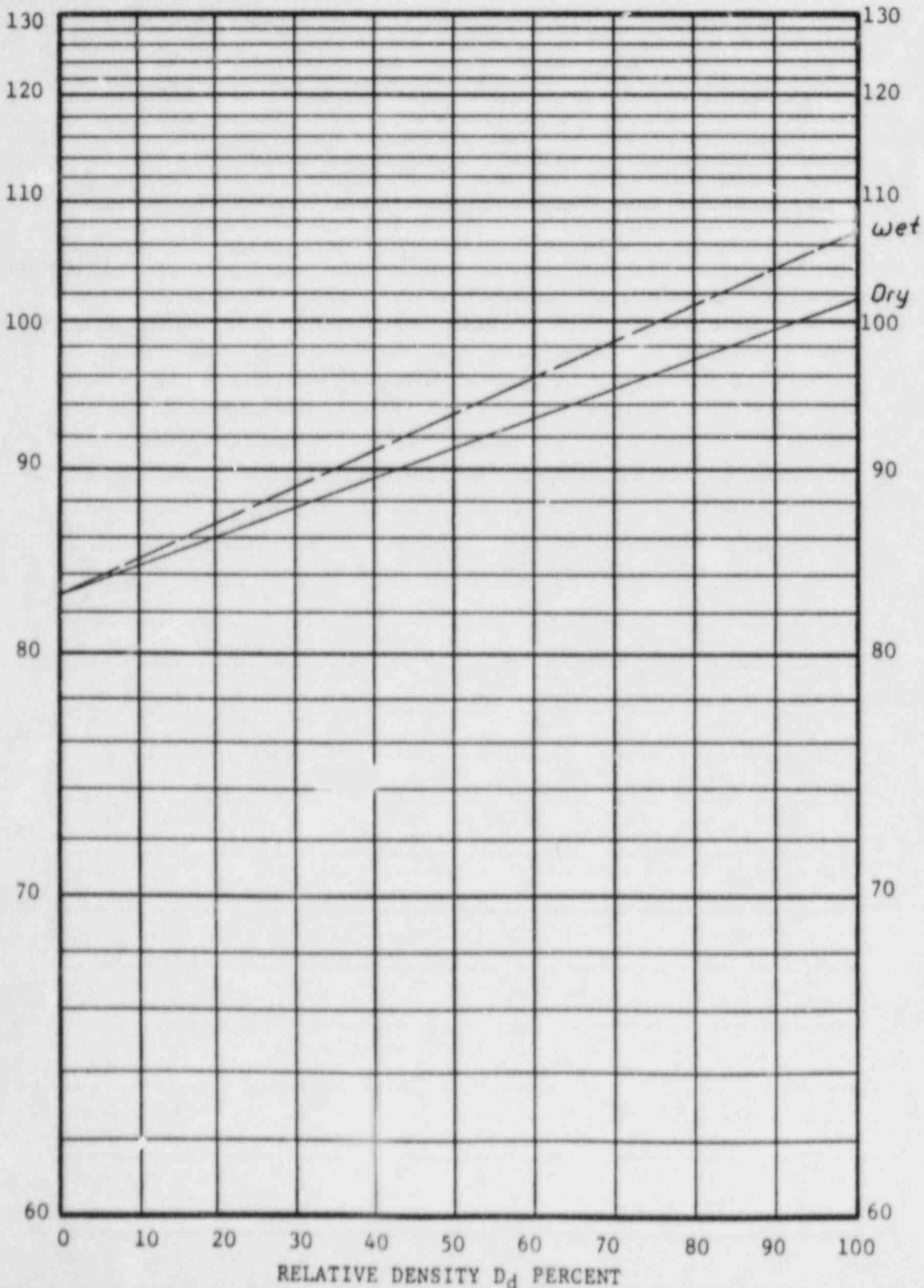
Y_d _____ e _____

D_d _____

Specific Gravity 2.66

Vib. Amplitude - 0.022"

Y_d - MINIMUM DENSITY - PCF



Y_d - MAXIMUM DENSITY - PCF

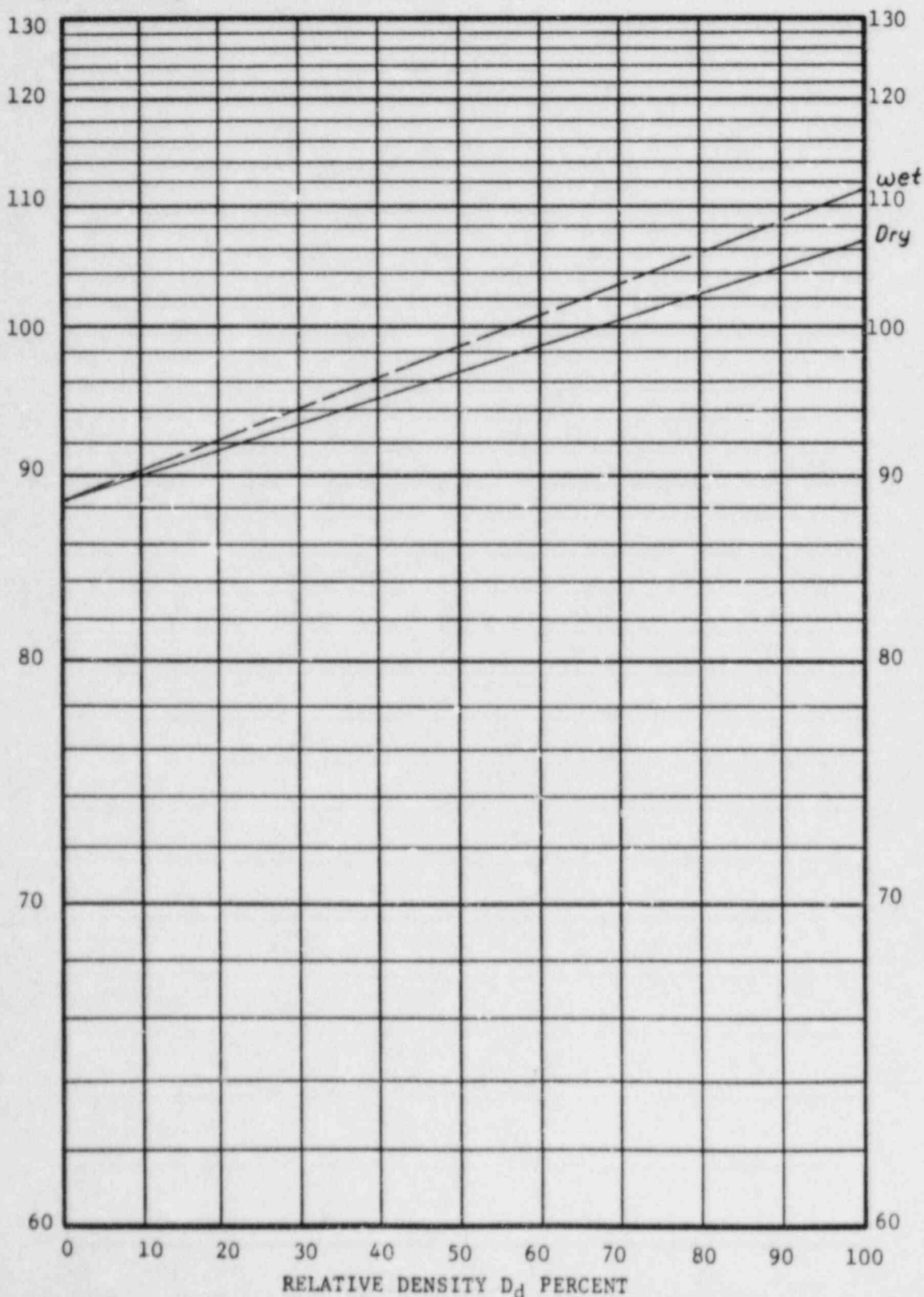
RELATIVE DENSITY TEST

DATE 7-31-84
 JOB NAME Plant Vogtle
 JOB NUMBER 7429
 BORING NUMBER Bag #1
 SAMPLE NUMBER 10
 DEPTH (FT.) _____
 MOLD SIZE 1/10 ft.³
 METHOD-MINIMUM DENSITY Funnel
 (FUNNEL OR SCOOP)
 METHOD-MAXIMUM DENSITY Dry & Wet
 (DRY OR WET)

γ_d (max) (wet) 111.3 e (min) _____
 γ_d (max) (dry) 106.8 e (min) _____
 γ_d (min) 88.4 e (max) _____
 γ_d _____ e _____
 D_d _____

Specific Gravity 2.65
 Vib. Amplitude - 0.022"

γ_d - MINIMUM DENSITY - PCF



γ_d - MAXIMUM DENSITY - PCF

RELATIVE DENSITY TEST

DATE 7-31-84

JOB NAME Plant Vogtle

JOB NUMBER 7429

BORING NUMBER Bag #1

SAMPLE NUMBER 11

DEPTH (FT.) _____

MOLD SIZE 1/10 ft.³

METHOD-MINIMUM DENSITY Funnel

(FUNNEL OR SCOOP)

METHOD-MAXIMUM DENSITY Dry & Wet

(DRY OR WET)

γ_d (max)(wet) 106.9 e (min) _____

γ_d (max)(dry) 106.9 e (min) _____

γ_d (min) 86.9 e (max) _____

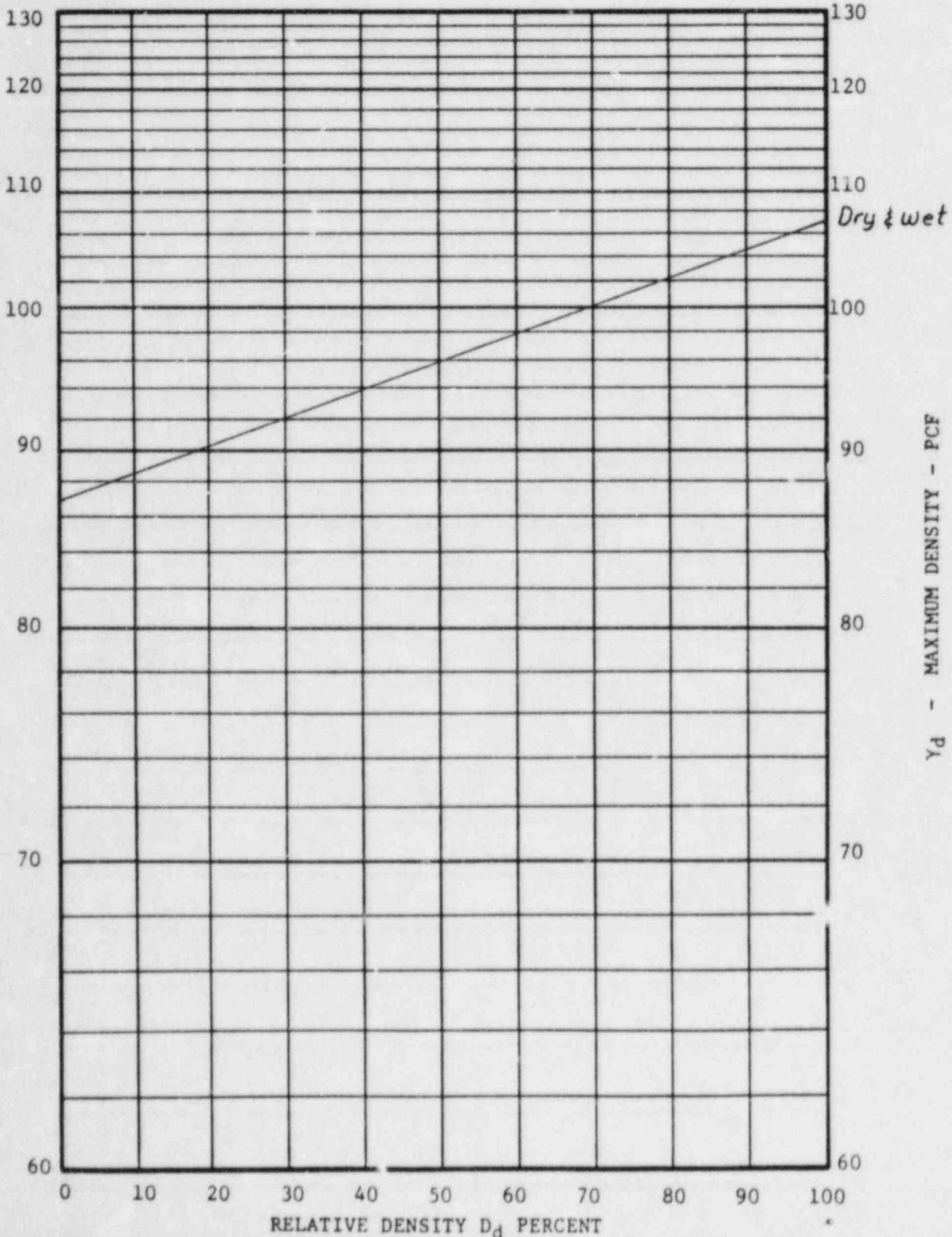
γ_d _____ e _____

D_d _____

Specific Gravity 2.67

Vib. Amplitude - 0.025"

γ_d - MINIMUM DENSITY - PCF



γ_d - MAXIMUM DENSITY - PCF

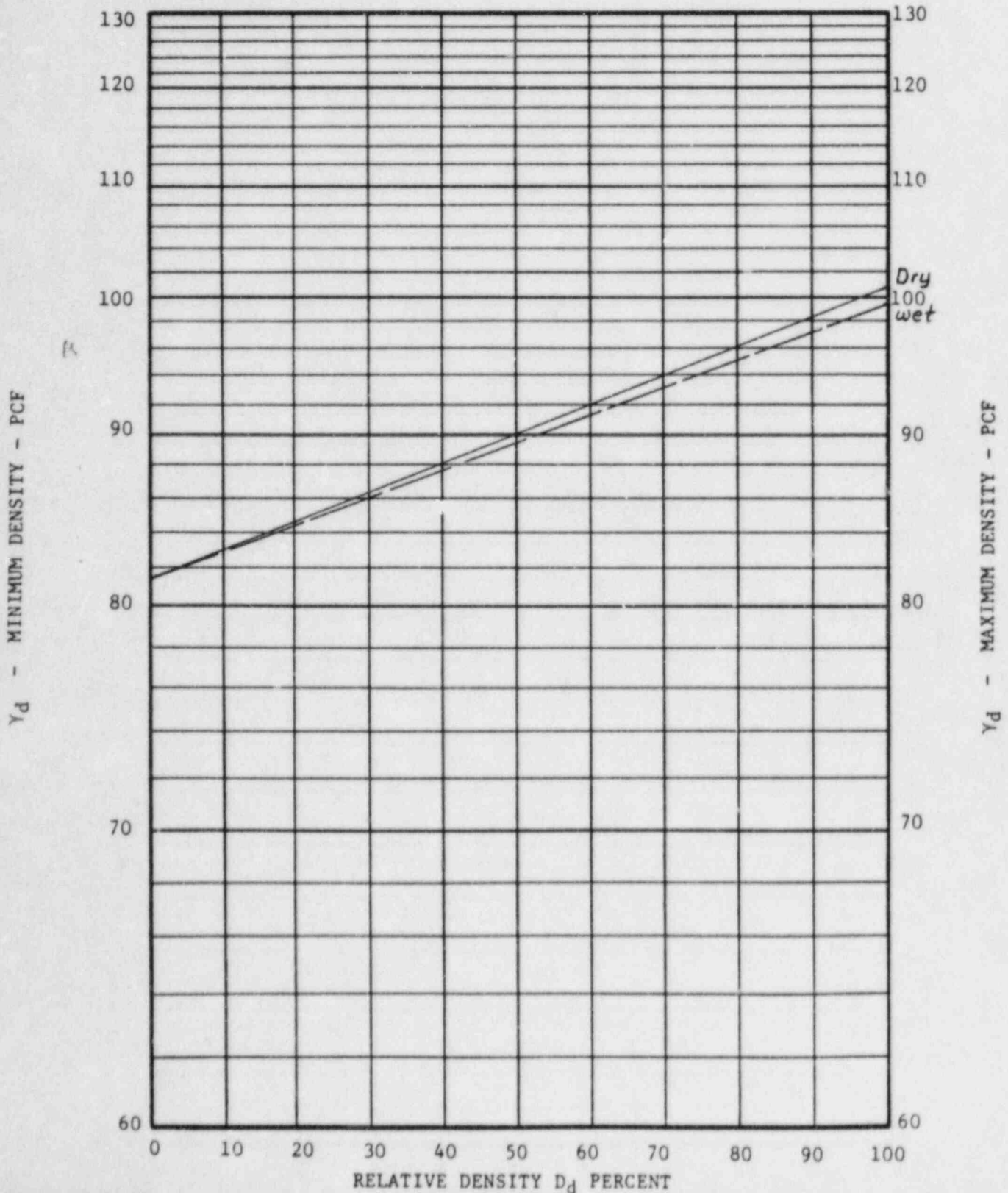
RELATIVE DENSITY TEST

DATE 7-31-84
 JOB NAME Plant Vogtle
 JOB NUMBER 7429
 BORING NUMBER Bag #1
 SAMPLE NUMBER 12
 DEPTH (FT.) _____
 MOLD SIZE 1/10 ft³
 METHOD-MINIMUM DENSITY Funnel
 (FUNNEL OR SCOOP)
 METHOD-MAXIMUM DENSITY Dry & Wet
 (DRY OR WET)

γ_d (max) (wet) 99.5 e (min) _____
 γ_d (max) (dry) 100.7 e (min) _____
 γ_d (min) 81.4 e (max) _____
 γ_d _____ e _____
 D_d _____

Specific Gravity 2.67

Vib. Amplitude - 0.025"



RELATIVE DENSITY TEST

DATE 7-31-84

JOB NAME Plant Vogtle

JOB NUMBER 7429

BORING NUMBER Bag #1

SAMPLE NUMBER 13

DEPTH (FT.) _____

MOLD SIZE 1/10 ft³

METHOD-MINIMUM DENSITY Funnel

(FUNNEL OR SCOOP)

METHOD-MAXIMUM DENSITY Dry & Wet

(DRY OR WET)

γ_d (max)(wet) 107.3 e (min) _____

γ_d (max)(dry) 102.6 e (min) _____

γ_d (min) 82.5 e (max) _____

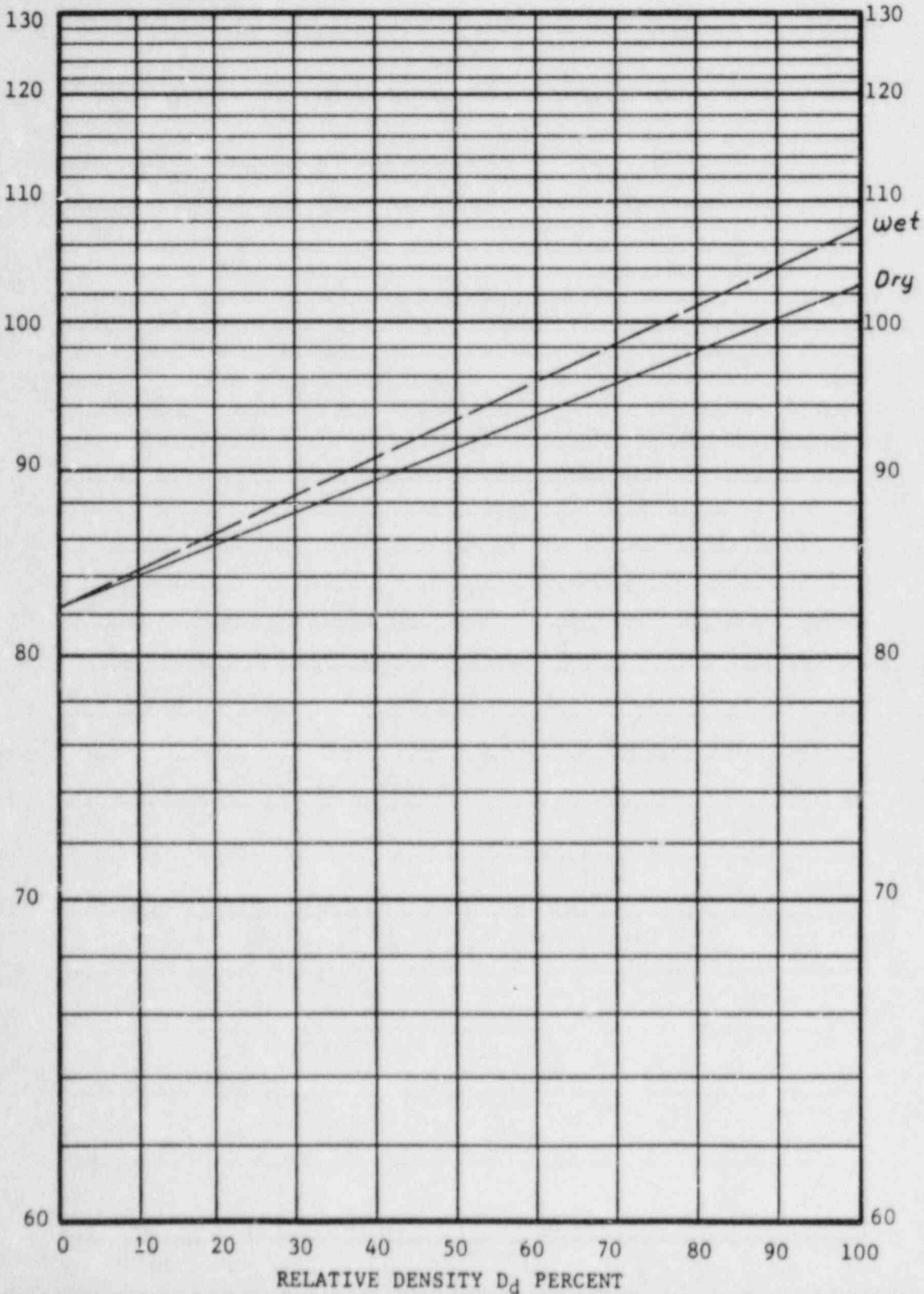
γ_d _____ e _____

D_d _____

Specific Gravity 2.68

Vib. Amplitude - 0.025"

γ_d - MINIMUM DENSITY - PCF



γ_p - MAXIMUM DENSITY - PCF

LAW ENGINEERING TESTING COMPANY
geotechnical, environmental & construction materials consultants

396 PLASTERS AVENUE, N.E.
P.O. BOX 13260 • ATLANTA, GEORGIA 30324
(404) 873-4781

August 31, 1984

Southern Company Services, Inc.
P.O. Box 2625
Birmingham, Alabama 35202

Attention: Mr. J. A. Dailey

Subject: Confirmatory Laboratory Testing Program
For Category I Backfill Permeability Testing
Vogtle Electrical Generating Plant
LETCo Job Number 7429

Gentlemen:

This report presents the results of the permeability tests which were performed on two (2) backfill materials for Plant Vogtle Project of Georgia Power Company.

I. INTRODUCTION:

Sample No. 10 and No. 11 were selected representing different grain size ranges, (5% to 9% passing the No. 200 sieve and 9% to 12% passing the No. 200 sieve respectively), to evaluate the coefficient of permeability by falling head method. Sample No. 10 had 5.9% passing the No. 200 sieve and sample No. 11 contained 11.0% passing the No. 200 sieve.

II. PROCEDURE:

A Modified Proctor Compaction Test (ASTM D1557-78, Method A) was performed on each sample to evaluate the maximum dry density of the soils, and permeability specimens then were compacted at approximately 100, 97, 94, and 91 percent of the modified proctor density. The samples were compacted in six layers using a moist tamping method utilizing a small height controlled tamper.

The permeability tests were performed in general accordance with the procedure described in Appendix VII of the Laboratory Testing Manual (EM 1110-2-1906, Permeability Tests with Back Pressure) published by the U.S. Army Corps of Engineers. The permeability tests with back pressure were performed in a pressure chamber (Triaxial Cell), and

by increasing the chamber pressure and back pressure at the same time, the saturation processes were completed. A pressure transducer was used to measure the "B" value, with the values ranging from 0.90 to 1.00. Utilizing a 2 KSF confining pressure, the sample then was consolidated until primary consolidation was completed. The coefficient of permeability by falling head method was calculated directly from computations using data obtained from a series of readings for each sample. At the end of each test, the sample was removed from the pressure chamber and the wet weight was obtained in order to calculate the unit weight and moisture content. Based on the final data, the actual density of each specimen was computed.

The results of moisture content, unit weights, void ratio, and permeability tests are shown on the tabulated laboratory test sheets which are attached to this report.

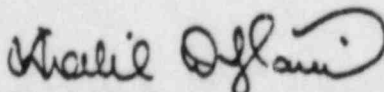
III. DISCUSSION:

Results of the permeability tests show that for sample No. 10 with 5.9% passing the No. 200 sieve, the coefficient of permeability ranges from approximately 2.0×10^{-3} cm/sec. to 6.0×10^{-3} cm/sec. For sample No. 11 with 11.0% passing the No. 200 sieve, the coefficient of permeability ranged from approximately 4.0×10^{-4} cm/sec. to 4.0×10^{-3} cm/sec.

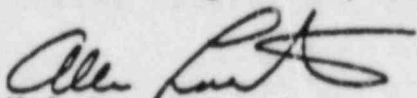
If you have any questions concerning this report or if we can be of additional assistance to you, please contact us.

Very truly yours,

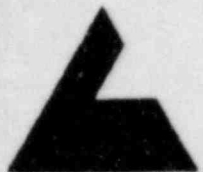
LAW ENGINEERING TESTING COMPANY



Khalil Dehghanian, EIT



William Allen Lancaster
Civil Engineer



LAW ENGINEERING TESTING COMPANY

General and Environmental & Construction Materials Consultants

396 PLASTER AVENUE N.E.
P.O. BOX 13260 • ATLANTA, GEORGIA 30324
(404) 873-4761JOB NO. 7129 SHEET 1 OF 1JOB NAME Plant VeggieBY R.D. DATE 8-15-84CHECKED BY 268 DATE 8/29/84Table of permeability Test results, Sample # 10
(Falling Head)

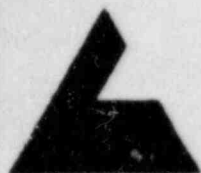
		92.9% of Compaction	93.9% of Compaction	95.7% of Compaction	99.8% of Compaction	Remarks
Permeability Test, K Cm/sec.		6.07×10^{-3}	4.58×10^{-3}	4.41×10^{-3}	2.26×10^{-3}	8 to 10 Trials
"B" Value		1.00	0.98	0.91	0.92	W/C.P. = 60 to 90 psi B.P. = 58 to 88 psi Conf. P. = 14 psi (2XSP)
Moisture Content (%)	Before Test	14.9	13.8	15.1	14.1	
	After Test	24.2	23.1	22.1	17.1	
Wet Unit wt. (pcf)	Before Test	115.1	115.3	118.8	122.7	
	After Test	124.5	124.7	126.0	125.9	
Dry Unit wt., pcf Before & After Test		100.2	101.3	103.2	107.6	mod. { $\gamma_d = 107.8$ pcf Pictor { w.c. = 14.7%
Void Ratio, e		0.651	0.633	0.603	0.538	S.G. = 2.65

Diameter of specimen = 2.88 In.

Height of specimen = 5.60 In.

Area of specimen = 3.770 Sq. In

Volume of specimen = 0.02111 Cu. In.

**LAW ENGINEERING TESTING COMPANY**

geotechnical, environmental & construction materials consultants

396 PLASTERS AVENUE NE
P.O. BOX 13260 • ATLANTA, GEORGIA 30324
(404) 873-4781JOB NO. 7d24 SHEET 1 OF 1JOB NAME plant VagileBY K.D. DATE 8-20-84CHECKED BY jet DATE 8/29/84

Table of permeability Test results, Sample # 11
(Falling Head)

		91.2% of Compaction	94 % of Compaction	97 % of Compaction	98.8 % of Compaction	Remarks
Permeability Test, K cm/sec.		4.11×10^{-3}	1.82×10^{-3}	1.43×10^{-3}	4.33×10^{-4}	8 to 10 trials
"B" Value		1.00	0.98	0.91	0.90	w/c.p. = 45 to 50 psi B.P. = 43 to 78 psi Conf. Press. = 14 psi
Moisture r (%)	Before Test	12.7	12.9	13.0	13.1	
	After Test	22.1	20.9	19.4	17.8	
Wet Unit wt. pcf	Before Test	118.5	122.4	126.3	128.8	
	After Test	128.7	131.1	133.5	136.5	
Dry Unit wt., pcf Before & After Test		105.2	108.4	111.8	113.9	mod. { $\gamma_d = 115.3$ pcf Proctor { w.c. = 13.2%
Void Ratio, e		0.585	0.537	0.491	0.463	S.G. = 2.67

Diameter of specimen = 2.88 In.

Height of specimen = 5.60 In.

Area of specimen = 3.770 Sq. In.

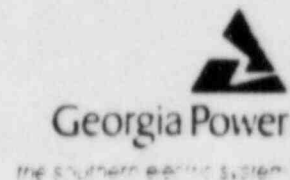
Volume of specimen = 0.02111 Cu. In

ix

APPENDIX 2

Georgia Power Company
Construction Department
Post Office Box 261
Waynesboro, Georgia 30389
Telephone 404 721 1401
404 721 1101
404 554 7111

Vogtle Electric Generating Plant



July 27, 1984

Mr. Jim Bailey
Nuclear Safety and License Department
Southern Company Services
P.O. Box 2625
Birmingham, Alabama 35202

Subject: Vogtle Electric Generating Plant - Units 1 & 2
Bechtel Job 9510-001, Laboratory Testing Program
for Category I Backfill

References: 1. Letter BS-5032, dated May 18, 1984
2. Letter BS-32159, dated May 25, 1984
3. Letter BG-32220, dated June 8, 1984

File No: X2BE02, X2BA06, X2AP01 C2.2

Correspondence No: C-4356

Security Code: NC

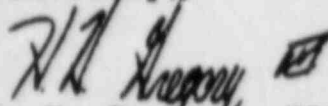
Dear Mr. Bailey:

Attached are the results of the on site soil testing carried out as required in references 1, 2, and 3. Also, attached is a summary sheet which shows the grain size and Modified Proctor results for each sample taken.

If you have any questions, please contact Winston Davis at extension 422 on site.

Mr. Jim Bailey
Bechtel Job 9510-001
July 27, 1984
Page 2

Sincerely,



H. H. Gregory, III
General Manager-
Vogtle Nuclear
Construction Department

WWD
WWD/HHG/lml

xc: D. O. Foster w/a-1
W. T. Nickerson w/a-1
O. Batum w/a-1
G. Bockhold w/a-1
M. Malcom w/a-1
H. D. Burnum w/a-1
M. H. Googe w/a-1
D. M. Fiquett w/a-1
cdc B. C. Harbin w/a-1
I. D. Innes w/a-1
D. Kinnsch w/a-1
W. R. Ferris w/a-1
M. A. Perovich w/a-1
Document Control - Original w/a-1
CDC w/a-1

GPC LAB TEST RESULTS

Sample No.	<u>Grain Size</u>				<u>Modified Proctor</u>	
	#8	#10	#40	#200	Max. Dry Density	Optimum Moisture
S1	100	DNR**	49.3	3.7	103.9	12.0
S2	100	DNR	62.1	4.0	101.9	11.3
S3	100	DNR	52.4	3.7	103.4	11.7
S4	100	DNR	41.5	4.4	104.7	13.5
S5	100	DNR	60.9	2.9	103.4	13.2
S6	100	DNR	52.5	3.2	104.7	15.0
S7	99.6	DNR	69.6	7.4	108.6	13.8
S8	Samples in the range could not be obtained at this time.					
S9	99.9	DNR	78.9	9.4	109.0	14.0
S10	99.5	DNR	64.7	5.6	106.8	10.4
S11	99	DNR	67.9	9.7	114.2	14.3
S12	100	DNR	80.9	9.3	110.1	13.5
S13	99.9	DNR	76.9	9.5	109.5	13.5

**DNR did not run

Confirmatory Lab Testing 1. D.

	Bag # 1	Bag # 2	Bag # 3	Bag # 4	Source
S-1	2.1%	2.9%	2.6%	3.1%	Borrow
S-2	3.3%	2.6%	2.9%	2.9%	Borrow
S-3	3.0%	3.3%	2.8%	2.5%	Borrow
S-4	3.0%	2.7%	2.6%	2.7%	Borrow
S-5	3.0%	2.9%	2.9%	3.1%	Fill
S-6	2.5%	2.8%	3.1%	2.9%	Fill
S-7	6.8%	6.9%	7.0%	7.1%	Borrow
S-8*					<u>Borrow</u>
S-9	9.8%	8.7%	8.9%	8.7%	Fill
S-10	5.1%	5.5%	6.3%	6.4%	Fill
S-11	9.3%	9.9%	9.3%	10.0%	Borrow
S-12	10.2%	9.5%	9.9%	9.9%	Borrow
S-13	9.4%	9.1%	9.4%	8.6%	Fill
S-14*					<u>Fill</u>

* Samples in this range could not be obtained at this time.

Proctor Sheet

Date 6-19-84	Sample Description Red Med-fine gr. Silty	
Inspector Copeland	SAND	
Pound Scale Used # C 3371	Gram Scale Used # C 2407	
Proctor No. S1 BAG 2	Hammer Control No. C 2410	
Method D 1557 A	Mold C 2409	Oven C 292

		1	2	3	4	5	6	7
Wet Density Determination	A	Weight Mold (lbs.)	9.37	9.37	9.37	9.37	9.37	9.37
	B	Mold Volume Factor (Volume)	30	30	30	30	30	30
	C	Water Added (ml.)	150	200	250	300	350	400
	D	Weight Soil and Mold (lbs.)	13.02	13.10	13.17	13.25	13.28	13.29
	E	Weight of Soil (lbs.) (D - A)	3.65	3.73	3.80	3.88	3.91	3.92
	F	Wet Density (lbs./ft. ³) (B x E)	109.5	111.9	114.0	116.4	117.3	117.6
Moisture Content Determination	G	Tare Number	R3	C1	C2	C3	C4	C5
	H	Tare Weight (grams)	47.9	49.2	49.8	49.0	48.7	49.3
	J	Wet Weight Sample + Tare (grams)	250.0	250.0	250.0	250.0	250.0	250.0
	K	Dry Weight Sample + Tare (grams)	238.8	235.0	232.0	228.5	225.7	223.3
	L	Weight of Dry Soil (grams) (K - H)	190.9	185.8	182.2	179.5	177.0	174.0
	M	Weight of Moisture (grams) (J - K)	11.2	15.0	18.0	21.5	24.3	26.7
	N	Percent Moisture (M/L x 100%)	5.9	8.1	9.9	12.0	13.7	15.3
	P	Dry Density (lbs./ft. ³) (F/(N + 100))	103.4	103.5	103.7	103.9	103.2	102.0

Maximum Dry Density (Proctor Density): 103.9 (lbs./ft.³) Optimum Moisture (%): 12.8
(From Curve) (From Curve)

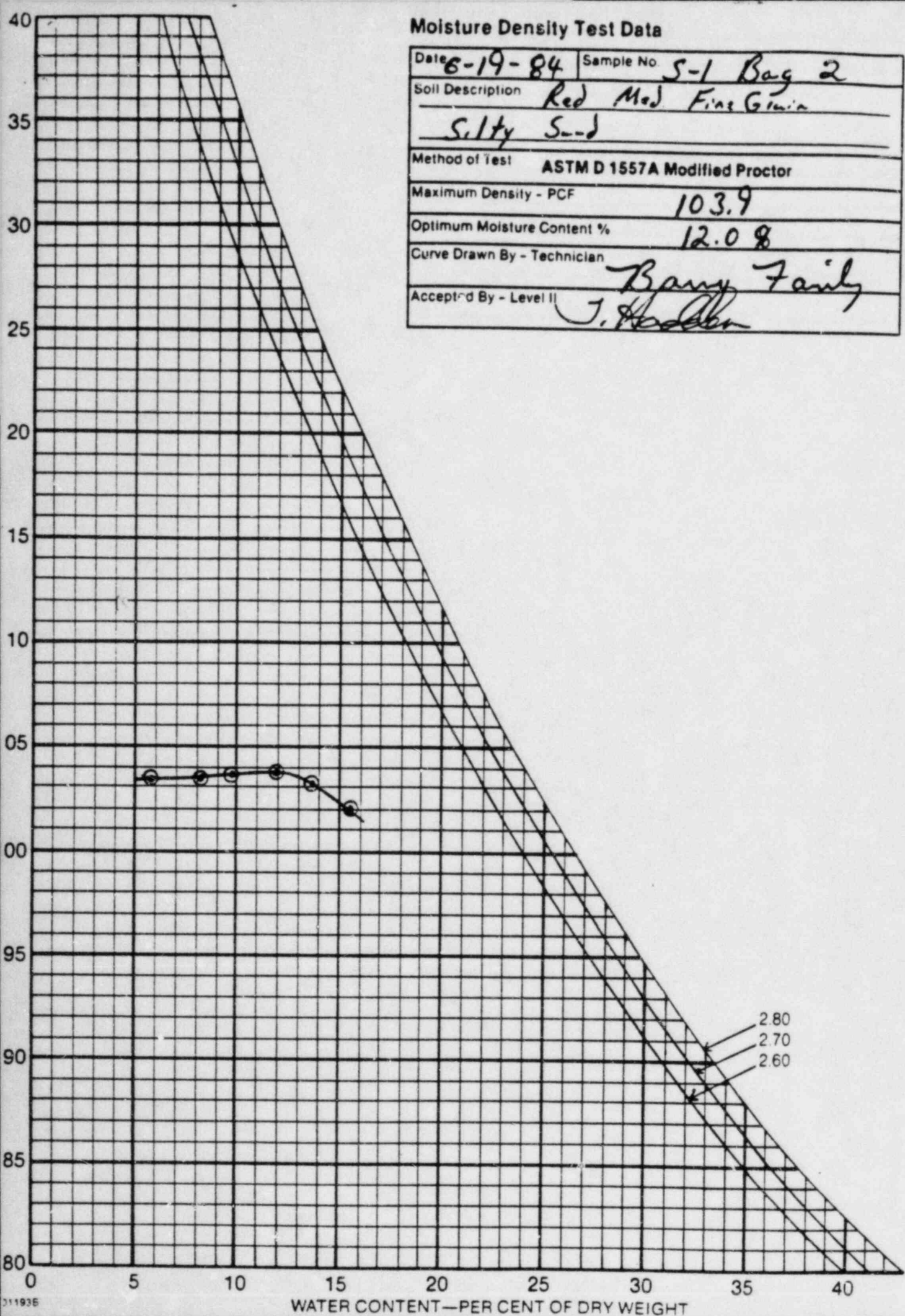
Accepted By: J. Hodder
Level II

Moisture Content obtained Prior to Compaction

49.1	49.7	47.5	47.6	47.0	47.6
B2	L1	L2	L3	L4	L5
250.0	250.0	250.0	250.0	250.0	250.0
238.8	235.2	231.8	228.0	225.5	223.0
189.7	185.5	184.3	180.4	178.5	175.4
11.2	14.8	18.2	22.0	24.5	27.0
5.9	8.0	9.9	12.2	13.7	15.3

Moisture Density Test Data

Date	6-19-84	Sample No.	S-1 Bag 2
Soil Description	Red Med Fine Grained Silty S-s		
Method of Test	ASTM D 1557A Modified Proctor		
Maximum Density - PCF	103.9		
Optimum Moisture Content %	12.0 %		
Curve Drawn By - Technician	Bany Faily		
Accepted By - Level II	J. Hadden		



Mo;
49.1
B2
250.0
238.8
189.7
11.2
5.0

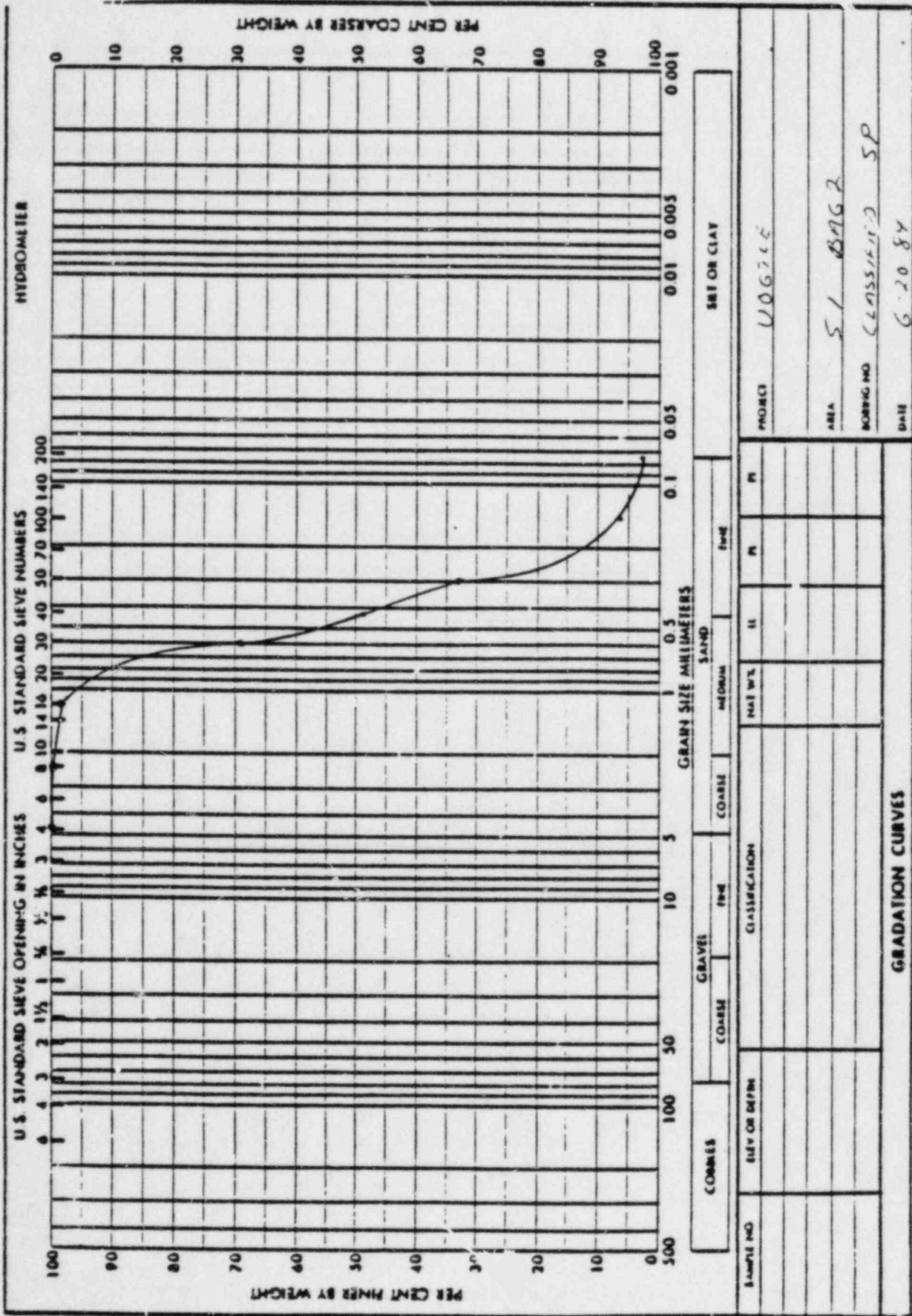
Wash 200 and Sieve Analysis

Date	6-19-84	Test No.	S-1 BAG 2
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Wash 200 (ASTM D1140) Inspector	J. Moore	Scale No.	C-2407	Sieve No.	C-1546
Oven Dry Weight Before Wash (grams)	530.8	Oven Dry Weight After Wash (grams)	511.9	% Passing 200 Sieve	3.6
Sieve Analysis (ASTM D422) Inspector	Copeland	Scale No.	C-2550	Oven No.	C-292

Sieve Size	Control No.	Cum. Wt. Retained	% Total Retained	% Total Passing
No. 4	C371	0	0	100
8	C344	0	0	100
16	C343	2.7	1.5	99.5
30	C379	164.3	31.0	69.0
40	C380	269.1	50.7	49.3
50	C860	351.1	66.1	33.9
100	C2514	499.5	94.1	5.9
200	C384	511.2	96.3	3.7
Pan	N/A	511.6		
Total	N/A	530.8		

Accepted By: W.C. Eubank Date: 6-20-84
Level II



Proctor Sheet

Date 6-19-84	Sample Description Reddish-Brown Med-fine gr	
Inspector Cape/And	Silty Sand	
Pound Scale Used # C 3371	Gram Scale Used # C 2407	
Proctor No. S2 BAG 2	Hammer Control No. C 2410	
Method DISSTA	Mold C 752	Oven C 292

		1	2	3	4	5	6	7
Wet Density Determination	A	Weight Mold (lbs.)	9.27	9.27	9.27	9.27	9.27	9.27
	B	Mold Volume Factor (Volume)	30	30	30	30	30	30
	C	Water Added (ml.)	150	200	250	300	350	400
	D	Weight Soil and Mold (lbs.)	12.82	12.87	12.96	13.05	13.10	13.21
	E	Weight of Soil (lbs.) (D - A)	3.55	3.60	3.69	3.78	3.83	3.94
	F	Wet Density (lbs./ft. ³) (B x E)	106.5	108.0	110.7	113.4	114.9	118.2
Moisture Content Determination	G	Tare Number	T1	T2	T3	T4	T5	T6
	H	Tare Weight (grams)	47.8	47.8	48.3	47.3	47.8	48.2
	J	Wet Weight Sample + Tare (grams)	250.0	250.0	250.0	250.0	250.0	250.0
	K	Dry Weight Sample + Tare (grams)	238.5	235.3	232.0	229.4	225.3	222.2
	L	Weight of Dry Soil (grams) (K - H)	190.7	187.5	183.7	182.1	177.5	174.0
	M	Weight of Moisture (grams) (J - K)	11.5	14.7	18.0	20.6	24.7	27.8
	N	Percent Moisture (M/L) x 100%	6.0	7.8	9.8	11.3	13.9	16.0
	P	Dry Density (lbs./ft. ³) (F/(N + 100))	100.5	100.2	100.8	101.9	100.9	101.6

Maximum Dry Density (Proctor Density): 101.9 (lbs./ft.³) Optimum Moisture (%): 11.3
(From Curve) (From Curve)

Moist. Content obtained prior to compaction

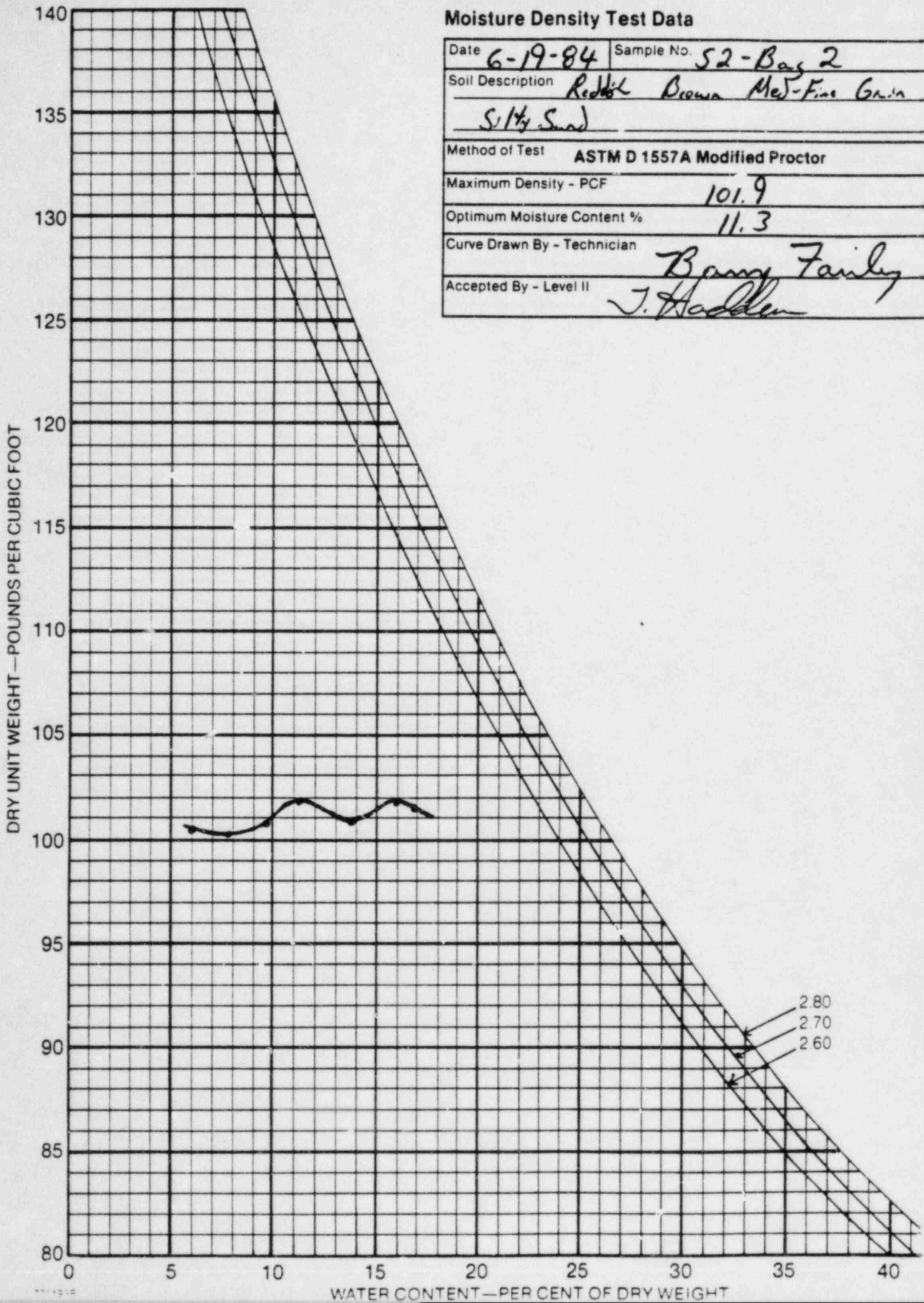
Accepted By:

J. Hadden
Level II

47.3	49.2	48.3	49.9	49.0	49.2	47.8
EB	E1	E2	E3	E4	E5	E6
250.0	250.0	250.0	250.0	250.0	250.0	250.0
238.5	235.2	231.9	228.7	225.6	222.1	219.0
191.2	186.0	183.6	178.8	176.6	172.9	171.2
11.5	14.8	18.1	21.3	24.4	27.9	31.0
6.0	8.0	9.9	11.9	13.8	16.1	18.1

Moisture Density Test Data

Date	6-19-84	Sample No.	S2-Bag 2
Soil Description	Reddish Brown Med-Fine Grain Silty Sand		
Method of Test	ASTM D 1557A Modified Proctor		
Maximum Density - PCF	101.9		
Optimum Moisture Content %	11.3		
Curve Drawn By - Technician	Benny Farley		
Accepted By - Level II	J. Hadden		



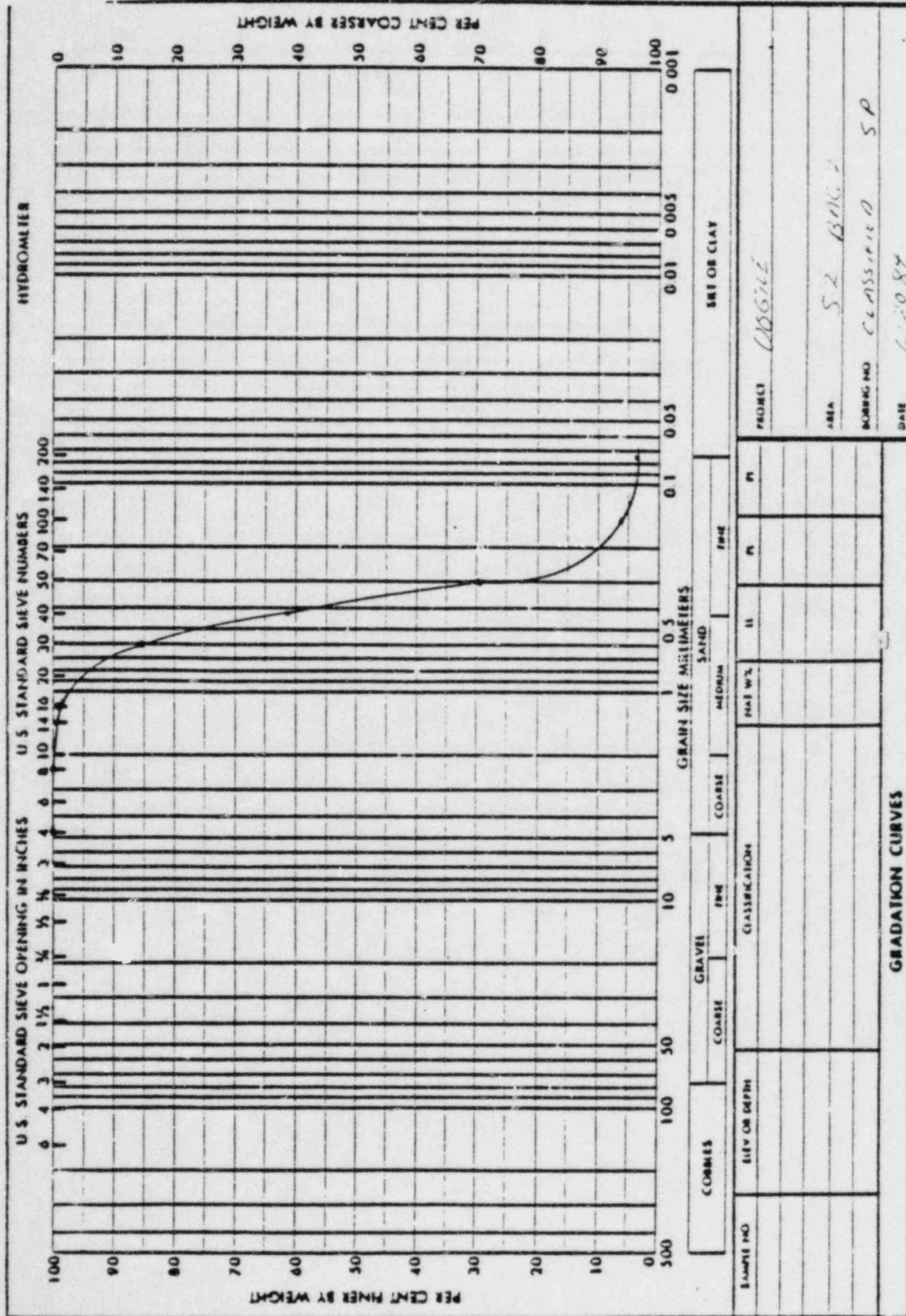
Wash 200 and Sieve Analysis

Date	6-19-84	Test No.	S2 BAG 2
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Wash 200 (ASTM D1140) Inspector	Scale No.	Sieve No.
Copeland, J. Moore	C 2407	C 378 C-1546
Oven Dry Weight Before Wash (grams)	Oven Dry Weight After Wash (grams)	% Passing 200 Sieve
587.5	567.3	3.4
Sieve Analysis (ASTM D422) Inspector	Scale No.	Oven No.
Copeland	C 2550	C 292

Sieve Size	Control No.	Cum. Wt. Retained	% Total Retained	% Total Passing
No. 4	C 371	C	C	100
8	C 344	O	C	100
16	C 343	2.8	.5	99.5
30	C 379	84.2	14.3	85.7
40	C 380	222.7	37.9	62.1
50	C 460	411.7	70.1	29.9
100	C 2514	551.7	93.9	6.1
200	C 384	564.0	96.0	4.0
Pan	N/A	566.9		
Total	N/A	587.5		

Accepted By: W. C. Sullivan Date: 6-20-84
Level II



200 Subbed

Proctor Sheet

Date	6-21-84	Sample Description	Dr. Med. Fine Grain
Inspector	Coplen, F. A. Jr.		Silty Sand
Pound Scale Used #	C-3371	Gram Scale Used #	C-2407
Proctor No.	S-3 B ₂	Hammer Control No	C-2410
Method	D-1557 A	Mold	C-2409 C-572 *C-752
		Cven	C-292

		1	2	3	4	* 5	6	7	
	A	Weight Mold (lbs.)	9.38	9.38	9.38	9.38	9.28	9.38	9.38
	B	Mold Volume Factor (Volume)	30	30	30	30	30	30	30
	C	Water Added (ml.)	150	200	250	300	325	350	400
Wet Density Determination	D	Weight Soil and Mold (lbs.)	12.99	13.09	13.13	13.23	13.15	13.29	13.33
	E	Weight of Soil (lbs.) (D - A)	3.61	3.71	3.75	3.85	3.87	3.91	3.95
	F	Wet Density (lbs./ft. ³) (B x E)	108.3	111.3	112.5	115.5	116.1	117.3	118.5
Moisture Content Determination	G	Tare Number	Y-6	Y-1	Y-2	Y-3	A-5	Y-4	Y-5
	H	Tare Weight (grams)	49.2	49.2	49.3	48.2	47.9	49.1	49.2
	J	Wet Weight Sample + Tare (grams)	250.0	250.0	250.0	250.0	250.0	250.0	250.0
	K	Dry Weight Sample + Tare (grams)	239.0	235.3	232.5	228.9	227.4	225.0	222.5
	L	Weight of Dry Soil (grams) (K - H)	189.8	186.1	183.2	180.7	179.5	175.9	173.3
	M	Weight of Moisture (grams) (J - K)	11.0	14.7	17.5	21.1	22.6	25.0	27.5
	N	Percent Moisture (M/L) x 100%	5.8	7.9	9.6	11.7	12.6	14.2	15.9
	P	Dry Density (lbs./ft. ³) (F/(N + 100))	102.3	103.2	102.6	103.4	103.1	102.7	102.2

Maximum Dry Density (Proctor Density):
(From Curve)

103.4

(lbs./ft.³)

Optimum Moisture (%):
(From Curve)

11.78

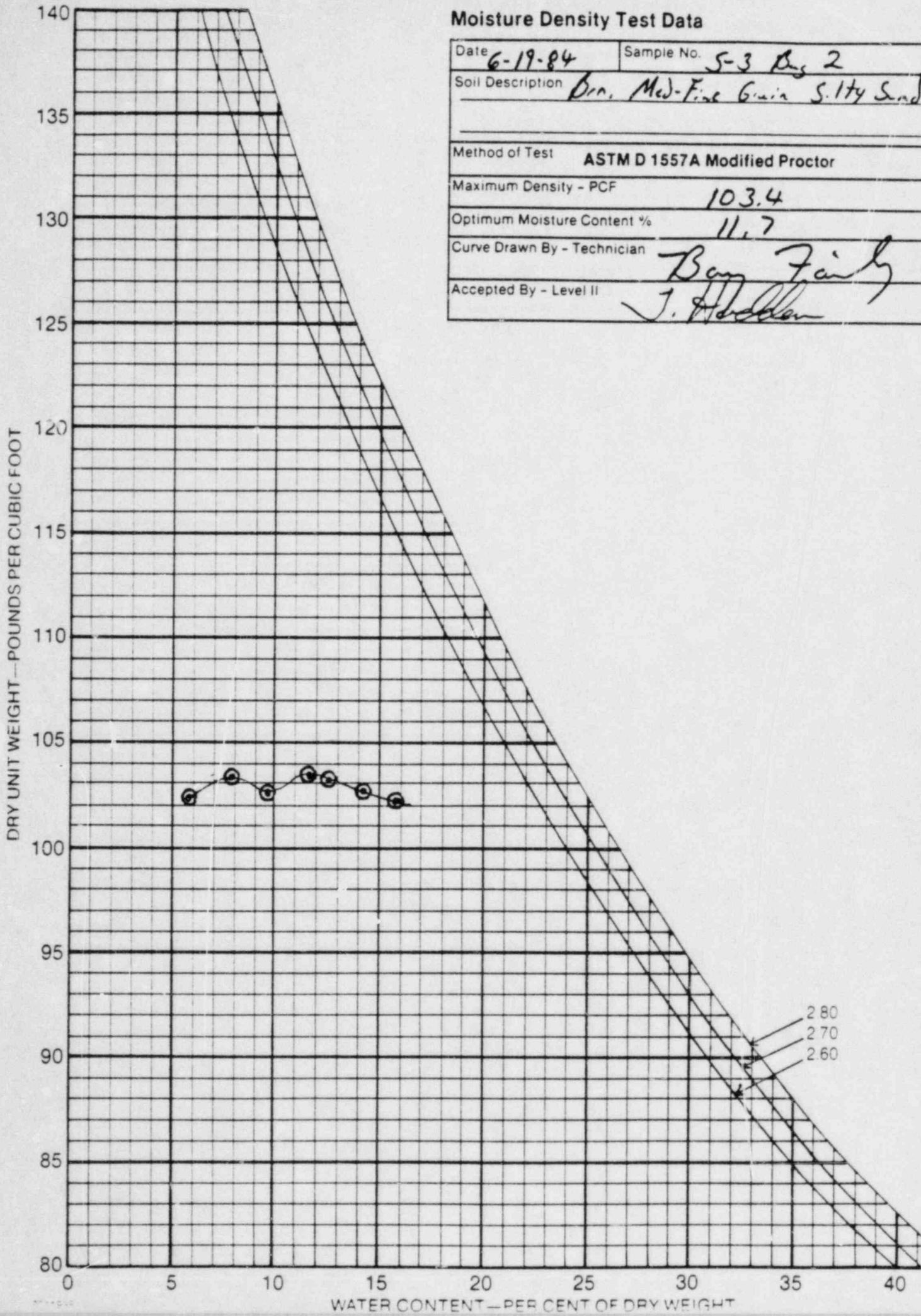
Accepted By:

[Signature]
Level II

①	②	③	④	⑤	⑥	⑦
48.2	49.1	49.1	49.4	48.5	49.0	49.2
YY-3	X-1	X-2	X-3	A-6	X-4	X-5
250.0	250.0	250.0	250.0	250.0	250.0	250.0
238.5	235.1	231.8	229.0	227.1	226.1	222.0
190.3	186.0	182.7	179.6	178.6	177.1	172.8
11.5	14.9	18.2	21.0	22.9	23.9	28.0
6.0	8.0	10.0	11.7	12.8	13.5	16.2

Moisture Density Test Data

Date	6-19-84	Sample No.	S-3 Bgs 2
Soil Description	Dn. Med-Fine Grain Silty Sand		
Method of Test	ASTM D 1557A Modified Proctor		
Maximum Density - PCF	103.4		
Optimum Moisture Content %	11.7		
Curve Drawn By - Technician	Ben Fairly		
Accepted By - Level II	J. Holden		



Wash 200 and Sieve Analysis

Date C-19-84	Test No. S3 BAG 2
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Wash 200 (ASTM D1140) Inspector Copeland, J. M. Moore	Scale No. C 2407	Sieve No. C-378 C-1546
Oven Dry Weight Before Wash (grams) 584.1	Oven Dry Weight After Wash (grams) 562.9	% Passing 200 Sieve 3.6
Sieve Analysis (ASTM D422) Inspector Copeland	Scale No. C 2550	Oven No. C292

Sieve Size	Control No.	Cum. Wt. Retained	% Total Retained	% Total Passing
No. 4	C371	0	0	100
8	C344	0	0	100
16	C343	3.8	.7	99.3
30	C379	145.4	24.9	75.1
40	C380	278.3	47.6	52.4
50	C860	380.2	65.1	34.9
100	C2514	549.6	94.1	5.9
200	C384	562.2	96.3	3.7
Pan	N/A	563.0		
Total	N/A	584.1		

L.A. Accepted By: W. E. Gulland Date: 6-20-84
 Level II

Proctor Sheet

Date <u>6-19-84</u>	Sample Description <u>BROWN Med-Fine gr</u>	
Inspector <u>Cope land</u>	Gram Scale Used # <u>C 2407</u>	
Pound Scale Used # <u>C 3371</u>	Hammer Control No. <u>C 2410</u>	
Proctor No. <u>S4 BAC 2</u>	Mold <u>C 752</u>	Gven <u>C 292</u>
Method <u>D1557A</u>		

		1	2	3	4	5	6	7
Wet Density Determination	A Weight Mold (lbs.)	9.29	9.29	9.29	9.29	9.29	9.29	
	B Mold Volume Factor (Volume)	30	30	30	30	30	30	30
	C Water Added (ml.)	150	200	250	300	350	400	
	D Weight Soil and Mold (lbs.)	12.89	12.96	13.07	13.12	13.25	13.27	
Moisture Content Determination	E Weight of Soil (lbs.) (D - A)	3.60	3.67	3.78	3.83	3.96	3.98	
	F Wet Density (lbs./ft. ³) (B x E)	108.0	110.1	113.4	114.9	118.8	119.4	
	G Tare Number	R1	A1	A2	A3	A4	A5	
	H Tare Weight (grams)	48.8	49.9	47.8	46.9	48.7	47.9	
	J Wet Weight Sample + Tare (grams)	250.0	250.0	250.0	250.0	250.0	250.0	
	K Dry Weight Sample + Tare (grams)	238.5	236.4	232.1	282.5	226.0	222.5	
	L Weight of Dry Soil (grams) (K - H)	189.7	186.5	184.3	181.6	177.3	174.6	
	M Weight of Moisture (grams) (J - K)	11.5	13.6	17.9	21.5	24.0	27.5	
	N Percent Moisture (M/L) x 100%	6.0	7.3	9.7	11.8	13.5	15.8	
	P Dry Density (lbs./ft. ³) (F / (N + 100))	101.9	102.6	103.4	102.8	104.7	103.1	

Maximum Dry Density (Proctor Density): 104.7 (lbs./ft.³) Optimum Moisture (%): 13.5
(From Curve) (From Curve)

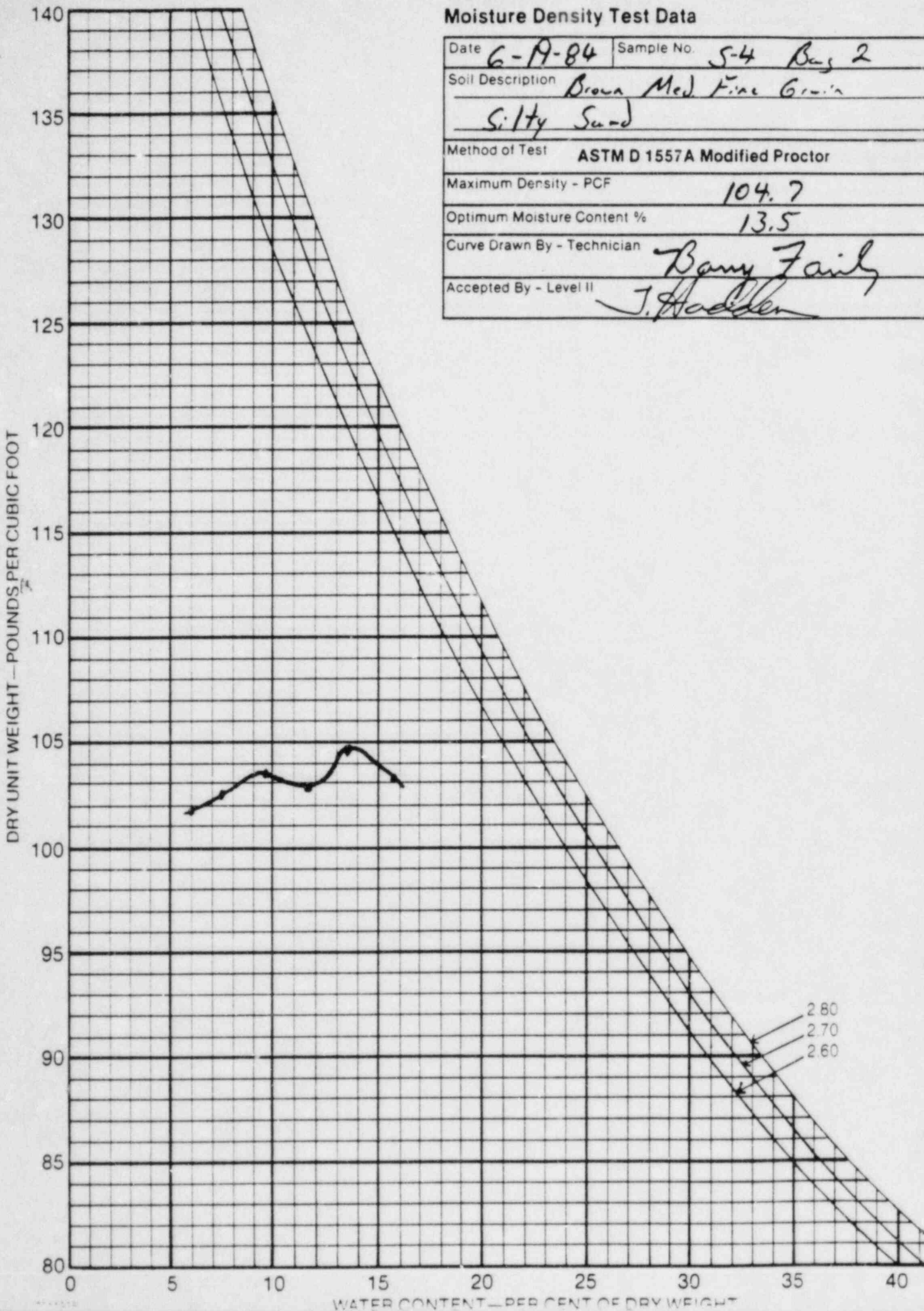
Accepted By: J. Hadden
Level II

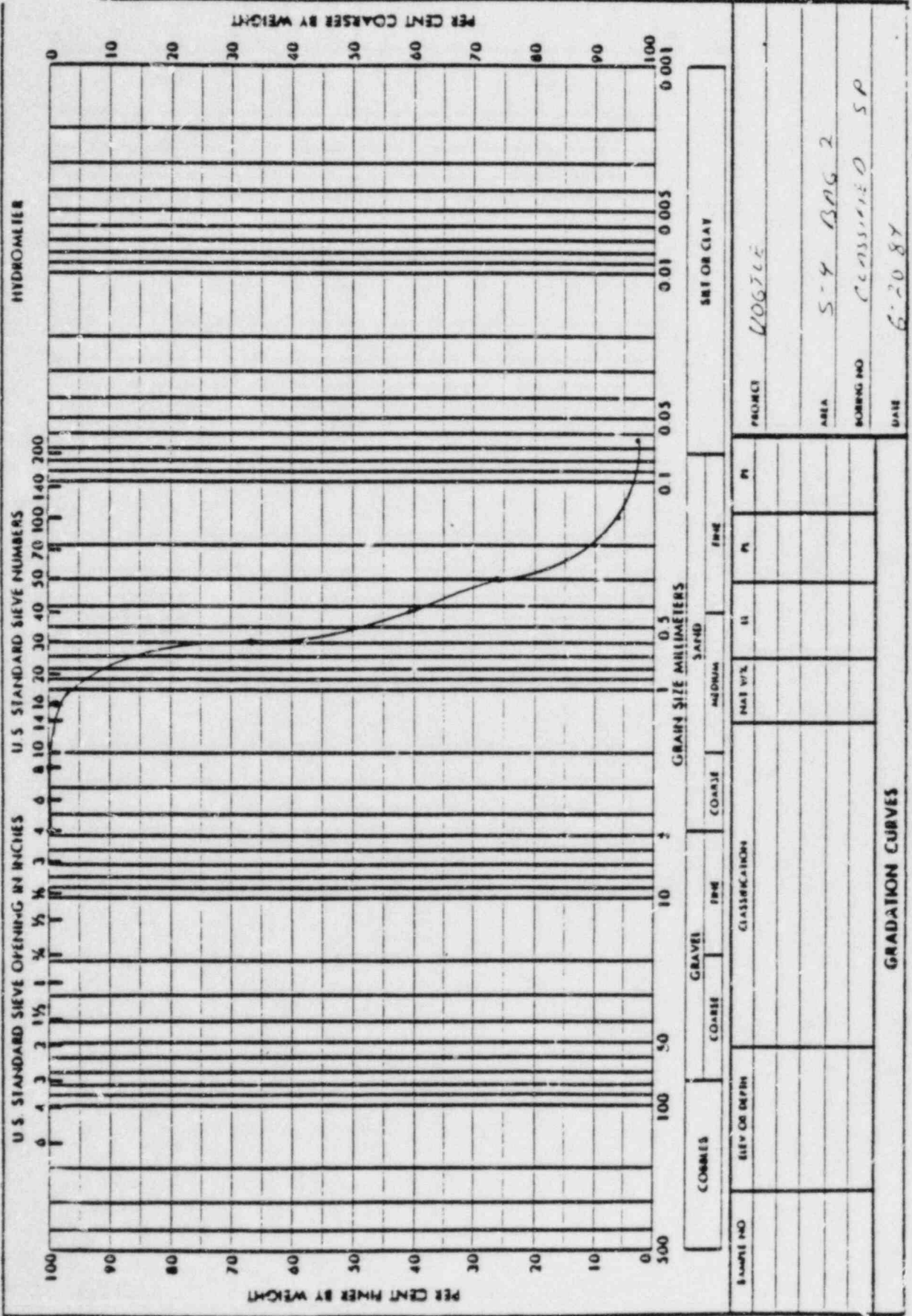
Moist. Content obtained prior To compaction

47.8	48.5	48.0	47.3	48.5	48.5
P6	P1	P2	P3	P4	P5
250.0	250.0	250.0	250.0	250.0	250.0
237.8	236.0	232.5	229.8	228.2	222.2
190.0	187.5	184.5	182.5	179.7	173.7
12.2	14.0	17.5	20.2	21.8	27.8
	7.5	9.5	11.1	12.1	16.0

Moisture Density Test Data

Date	6-19-84	Sample No.	S-4 Bag 2
Soil Description	Brown Med. Fine Grain Silty Sand		
Method of Test	ASTM D 1557A Modified Proctor		
Maximum Density - PCF	104.7		
Optimum Moisture Content %	13.5		
Curve Drawn By - Technician	Bany Fairly		
Accepted By - Level II	J. Hadden		





WC Gabbard

Proctor Sheet

Date 6-22-84	Sample Description BROWNISH-TAN MED-FINE	
Inspector P. CAWADAY	GRAIN SILTY SAND	
Pound Scale Used # C-3371	Gram Scale Used # C 2407	
Proctor No. S-5 BA9 #2	Hammer Control No. C 2410	
Method ASTM D 1557A	Mold C 2409	Oven C 292

		1	2	3	4	5	6	7
Wet Density Determination	A	Weight Mold (lbs.)	9.36	9.36	9.36	9.36	9.36	9.36
	B	Mold Volume Factor (Volume)	30	30	30	30	30	30
	C	Water Added (ml.)	100	150	200	250	300	350
	D	Weight Soil and Mold (lbs.)	12.89	12.96	13.03	13.11	13.19	13.27
Moisture Content Determination	E	Weight of Soil (lbs.) (D - A)	3.53	3.60	3.67	3.75	3.83	3.91
	F	Wet Density (lbs./ft. ³) (B x E)	105.9	108.0	110.1	112.5	114.9	117.3
	G	Tare Number	E-1	E-2	E-3	E-4	E-5	X-1
	H	Tare Weight (grams)	49.2	48.3	49.9	49.0	49.2	49.1
	J	Wet Weight Sample + Tare (grams)	249.2	248.3	249.9	249.0	249.2	249.1
	K	Dry Weight Sample + Tare (grams)	241.8	237.1	234.9	231.1	228.1	225.8
	L	Weight of Dry Soil (grams) (K - H)	192.6	188.8	185.0	182.1	178.9	176.7
	M	Weight of Moisture (grams) (J - K)	7.4	11.2	15.0	17.9	21.1	23.3
	N	Percent Moisture (M/L x 100%)	3.8	5.9	8.1	9.8	11.8	13.2
	P	Dry Density (lbs./ft. ³) (F/(N + 100))	102.0	102.0	101.9	102.5	102.8	103.4

Maximum Dry Density (Proctor Density): 103.4 (lbs./ft.³) Optimum Moisture (%): 13.2
(From Curve) (From Curve)

DF

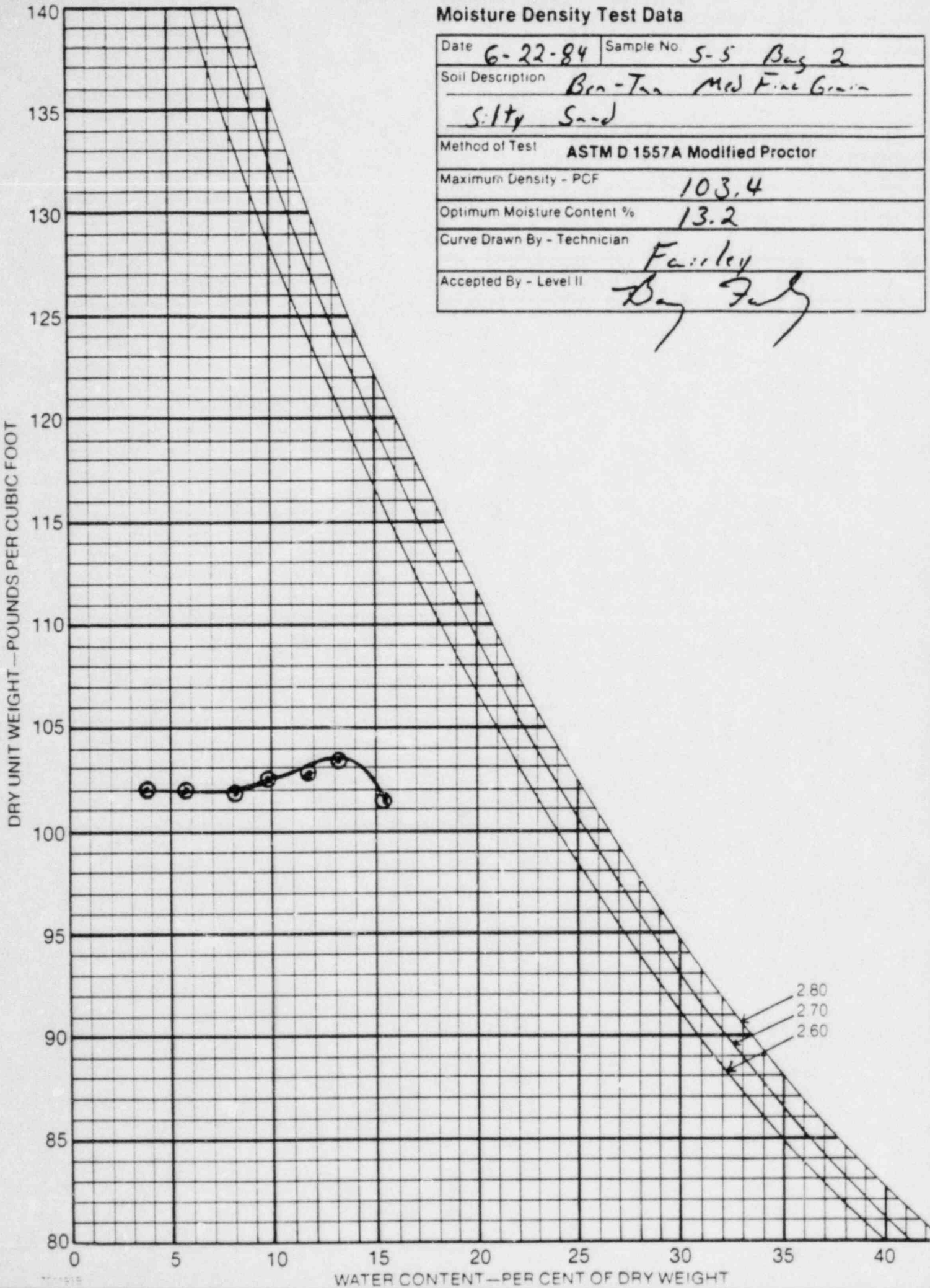
Accepted By:

Bang Fairly
Level II

	AA-1	AA-2	AA-3			
# 1	# 2	# 3	# 4	# 5	# 6	# 7
missed	missed	47.8	47.9	48.5	47.6	47.9
		297.7	293.3	274.3	277.2	267.7
		279.6	271.1	249.4	248.9	237.3
		231.8	223.2	200.9	201.3	189.4
		18.1	22.2	24.9	28.3	30.4
		7.8	9.9	12.4	14.1	16.1

Moisture Density Test Data

Date	6-22-84	Sample No.	S-5 Bag 2
Soil Description	Ben-Tan Med Fine Grain Silty Sand		
Method of Test	ASTM D 1557A Modified Proctor		
Maximum Density - PCF	103.4		
Optimum Moisture Content %	13.2		
Curve Drawn By - Technician	Fairley		
Accepted By - Level II	Dy Fuly		



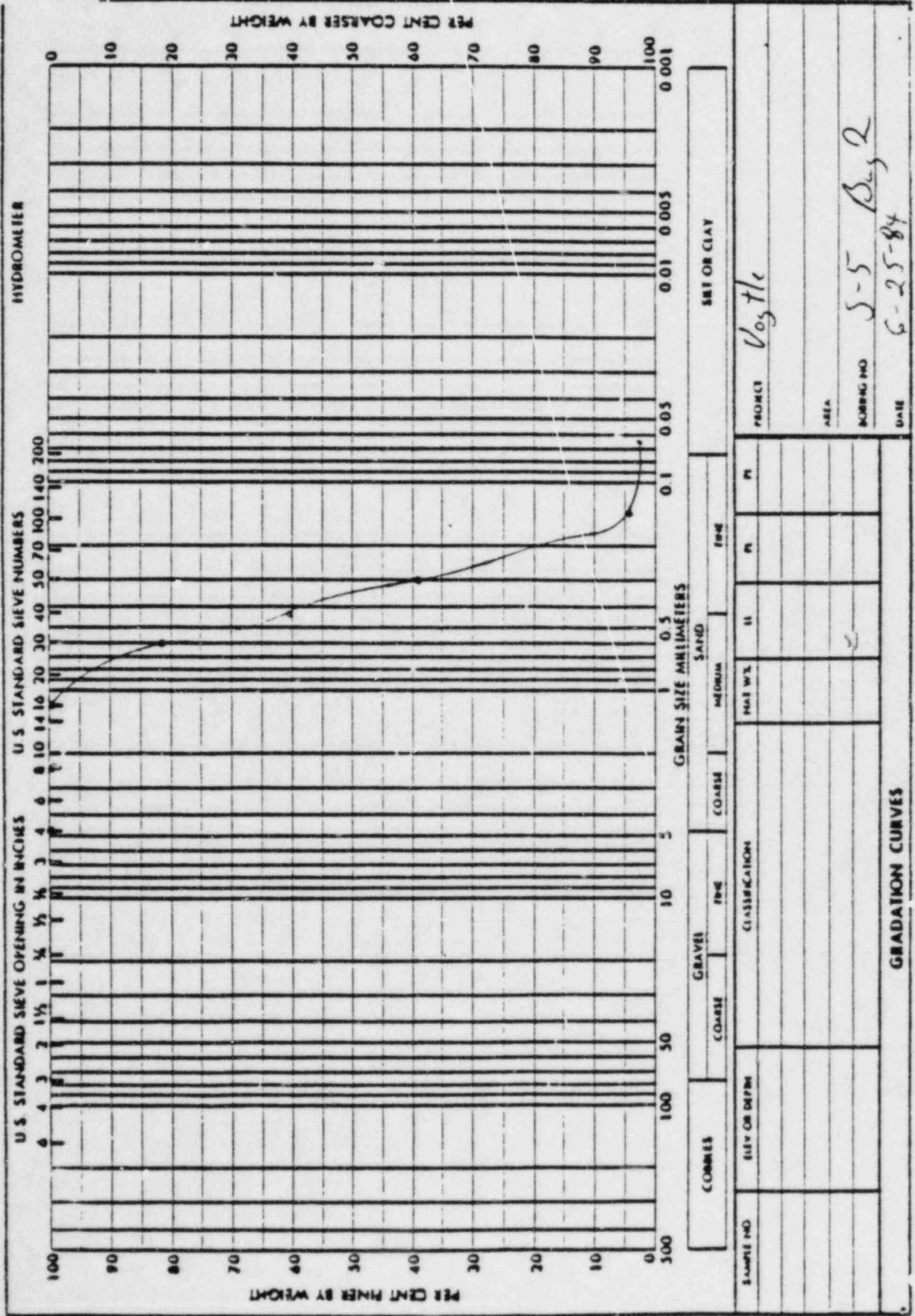
Wash 200 and Sieve Analysis

Date	6-25-84	Test No.	S5 BA2
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Wash 200 (ASTM D1140) Inspector	Pattard	S Scale No.	C-2550	Sieve No.	C-1546
Oven Dry Weight Before Wash (grams)	557.6	Oven Dry Weight After Wash (grams)	543.3	% Passing 200 Sieve	2.6
Sieve Analysis (ASTM D422) Inspector	Pattard	S Scale No.	C-2550	Oven No.	C-202

Sieve Size	Control No.	Cum. Wt. Retained	% Total Retained	% Total Passing
No. 4	371	0	0	100.0
8	344	0	0	100.0
16	343	1.8	0.3	99.7
30	319	100.1	18.0	82.0
40	380	218.0	39.1	60.9
50	860	338.1	60.6	39.4
100	2514	530.6	95.2	4.8
200	384	541.4	97.1	2.9
Pan		542.8		
Total		557.6		

Accepted By: Michael B. Pattard 6-25-84
 Level II Date



PROJECT *Ugite*

AREA

NO. OF BORINGS *S-5 Bay 2*

DATE *6-25-84*

GRADATION CURVES

Proctor Sheet

Date 6-21-84	Sample Description Dr. Med Fine Grains	
Inspector Pice, Family, Goins,	Silty Sand	
Pound Scale Used # C-3371	Gram Scale Used # C-2407	
Proctor No. S-6 Bag 2	Hammer Control No. C-2410	
Method D-1557 A	Mold C-2409 * C-752	Oven C-292

		* 1	2	3	4	5	6	7
Wet Density Determination	A	Weight Mold (lbs.)	9.28	9.36	9.36	9.36	9.36	9.36
	B	Mold Volume Factor ($\frac{\text{Volume}}{\text{Volume}}$)	30	30	30	30	30	30
	C	Water Added (ml.)	100	150	200	250	300	400
	D	Weight Soil and Mold (lbs.)	12.84	13.02	13.09	13.16	13.23	13.39
Moisture Content Determination	E	Weight of Soil (lbs.) (D - A)	3.56	3.66	3.73	3.80	3.87	4.03
	F	Wet Density (lbs./ft. ³) (B x E)	106.8	109.8	111.9	114.0	116.1	120.9
	G	Tare Number	A-3	E-2	E-3	E-4	E-5	T-1
	H	Tare Weight (grams)	46.9	48.3	49.9	49.0	49.2	47.8
	J	Wet Weight Sample + Tare (grams)	250.0	250.0	250.0	250.0	250.0	250.0
	K	Dry Weight Sample + Tare (grams)	242.2	239.8	236.0	232.9	229.0	225.2
	L	Weight of Dry Soil (grams) (K - H)	195.3	191.5	186.1	183.9	179.8	177.4
	M	Weight of Moisture (grams) (J - K)	7.8	10.2	14.0	17.1	21.0	24.8
	N	Percent Moisture (M/L) x 100%	4.0	5.3	7.5	9.3	11.7	14.0
	P	Dry Density (lbs./ft. ³) (F / (N + 100))	102.7	104.3	104.1	104.3	103.9	104.5

Maximum Dry Density (Proctor Density): 104.7 (lbs./ft.³) Optimum Moisture (%): 15.08
(From Curve) (From Curve)

Accepted By: King F...

Level II

①	②	③	④	⑤	⑥	⑦	⑧
48.7	49.0	48.4	48.9	49.2	49.0	49.6	47.8
A-4	BB-2	BB-3	BB-4	BB-5	BB-6	BB-7	AA-1
250.0	250.0	250.0	250.0	250.0	250.0	250.0	263.4
242.1	239.6	235.8	232.7	228.6	225.9	222.1	232.1
193.4	190.6	187.4	183.6	179.4	176.9	172.5	184.3
7.9	10.4	14.2	17.5	21.4	24.1	27.9	31.3
4.1	5.5	7.6	9.5	11.9	13.6	16.2	17.0

Proctor Sheet

Date	6-21-84	Sample Description	Ben Med Fine Grain	
Inspector	Pice, Farley, Goring		Silty Sand	
Pound Scale Used #	C-3371	Gram Scale Used #	C-2407	
Proctor No.	S-6 Bag 2	Hammer Control No.	C-2410	
Method	D-1557 A	Mold	C-2409	Given C-292

		1	2	3	4	5	6	7
Wet Density Determination	A	Weight Mold (lbs.)	9.36					
	B	Mold Volume Factor ($\frac{\text{Volume}}{\text{Volume}}$)	30	30	30	30	30	30
	C	Water Added (ml.)	450					
	D	Weight Soil and Mold (lbs.)	13.36					
	E	Weight of Soil (lbs.) (D - A)	4.00					
Moisture Content Determination	F	Wet Density (lbs./ft. ³) (B x E)	120.0					
	G	Tare Number	E-3					
	H	Tare Weight (grams)	49.9					
	J	Wet Weight Sample + Tare (grams)	249.9					
	K	Dry Weight Sample + Tare (grams)	221.7					
	L	Weight of Dry Soil (grams) (K - H)	171.8					
	M	Weight of Moisture (grams) (J - K)	28.2					
	N	Percent Moisture (M/L) x 100%	16.4					
	P	Dry Density (lbs./ft. ³) (F / (N + 100))	103.1					

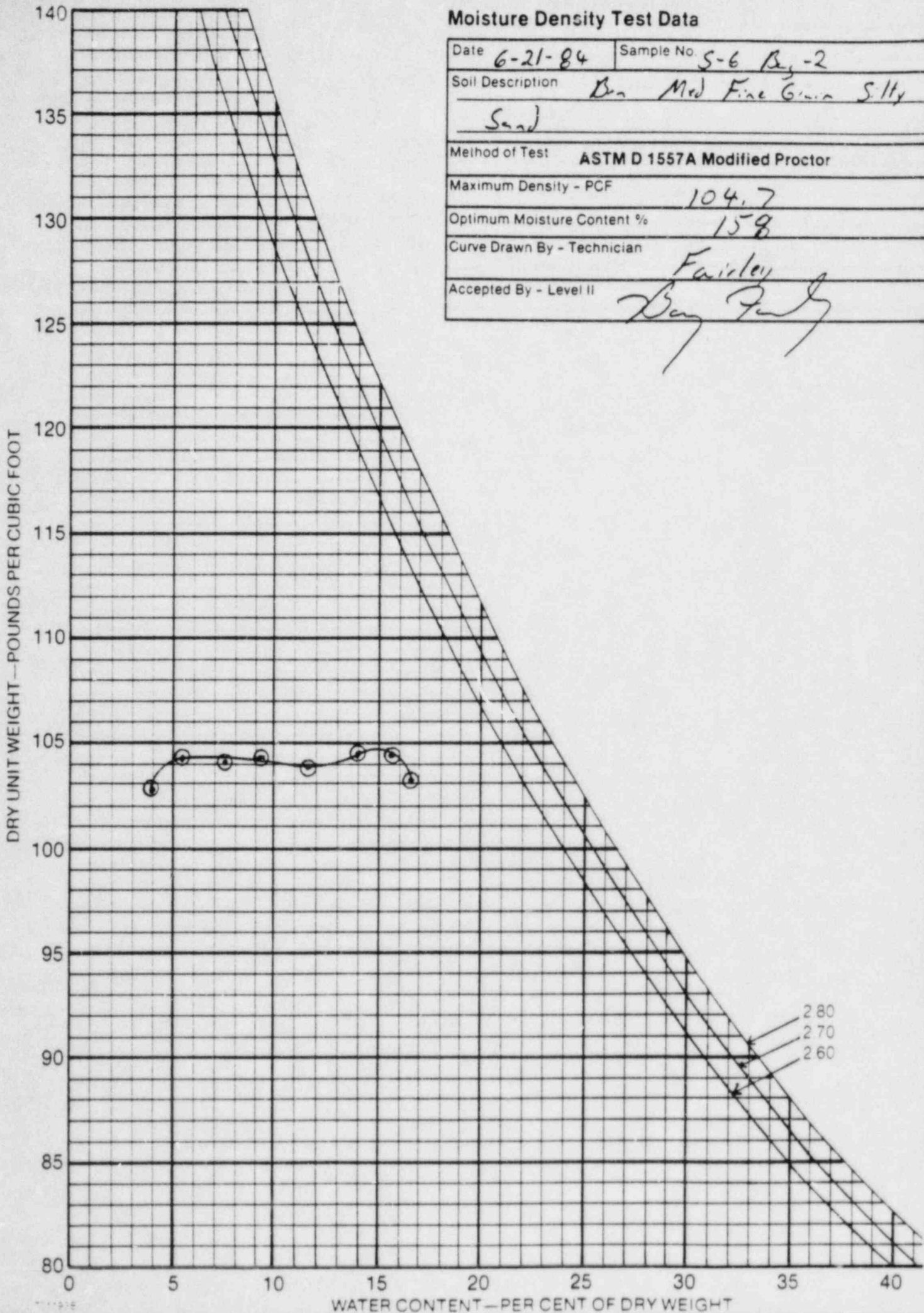
Maximum Dry Density (Proctor Density): 104.7 (lbs./ft.³) Optimum Moisture (%): 15.08
(From Curve) (From Curve)

Accepted By: Ben Farley

Level II

Moisture Density Test Data

Date	6-21-84	Sample No.	S-6 B ₂ -2
Soil Description	B ₂ Med Fine Gr. Silty Sand		
Method of Test	ASTM D 1557A Modified Proctor		
Maximum Density - PCF	104.7		
Optimum Moisture Content %	15.8		
Curve Drawn By - Technician	Fairley		
Accepted By - Level II	Dany F...		



Proctor Sheet

Date	6-21-84	Sample Description	Bn. Med Fine Grain
Inspector	Pice * Goins		Silty Sand
Pound Scale Used #	C-3371	Gram Scale Used #	C-2407
Proctor No.	S-7 Bag 2	Hammer Control No	C-2410
Method	D-1557 A	Mold	C-252
		Gven	C-292

* C-2409
*

		1	2	3	4	5	6	7	
Wet Density Determination	A	Weight Mold (lbs.)	9.29	9.29	9.29	9.29	9.29	9.36	9.29
	B	Mold Volume Factor ($\frac{\text{Volume}}{\text{Volume}}$)	30	30	30	30	30	30	30
	C	Water Added (ml.)	100	150	200	250	300	350	400
	D	Weight Soil and Mold (lbs.)	12.98	13.07	13.15	13.24	13.34	13.48	13.45
Moisture Content Determination	E	Weight of Soil (lbs.) (D - A)	3.69	3.78	3.86	3.95	4.05	4.12	4.16
	F	Wet Density (lbs./ft. ³) (B x E)	110.7	113.4	115.8	118.5	121.5	123.6	124.8
	G	Tare Number	AA1	AA2	AA3	AA4	AA5	E2	AA7
	H	Tare Weight (grams)	47.8	47.9	48.5	47.6	47.9	48.3	47.8
	J	Wet Weight Sample + Tare (grams)	250.0	250.0	250.0	250.0	250.0	248.3	250.0
	K	Dry Weight Sample + Tare (grams)	242.4	238.8	235.2	231.8	228.2	224.0	222.9
	L	Weight of Dry Soil (grams) (K - H)	194.6	190.9	186.7	184.2	180.3	175.7	175.1
	M	Weight of Moisture (grams) (J - K)	7.6	11.2	14.8	18.2	21.8	24.3	27.1
	N	Percent Moisture (M/L) x 100%	3.9	5.9	7.9	9.9	12.1	13.8	15.5
	P	Dry Density (lbs./ft. ³) (F / (N + 100))	106.5	107.1	107.3	107.8	108.1	108.6	109.1

Maximum Dry Density (Proctor Density): 108.6 (lbs./ft.³) Optimum Moisture (%): 13.8
(From Curve) (From Curve)

Accepted By:

Big Fish
Level II
A-1 AA-3 (match up Sample 6)

X1	X2	X3	X4	X5		
250.0	250.0	250.0	250.0	250.0	250.0	250.9
242.1	238.5	235.4	232.0	227.9	222.0	225.4
49.1	49.1	49.4	49.0	49.2	49.9	48.5
193.0	189.4	186.0	183.0	178.7	172.1	176.9
7.9	11.5	14.6	18.0	22.1	28.0	25.5
4.1	6.1	7.0	9.0	12.6	11.7	11.1

Wash 200 and Sieve Analysis

Date	6-24-84	Test No.	S-6 B ₃ -2
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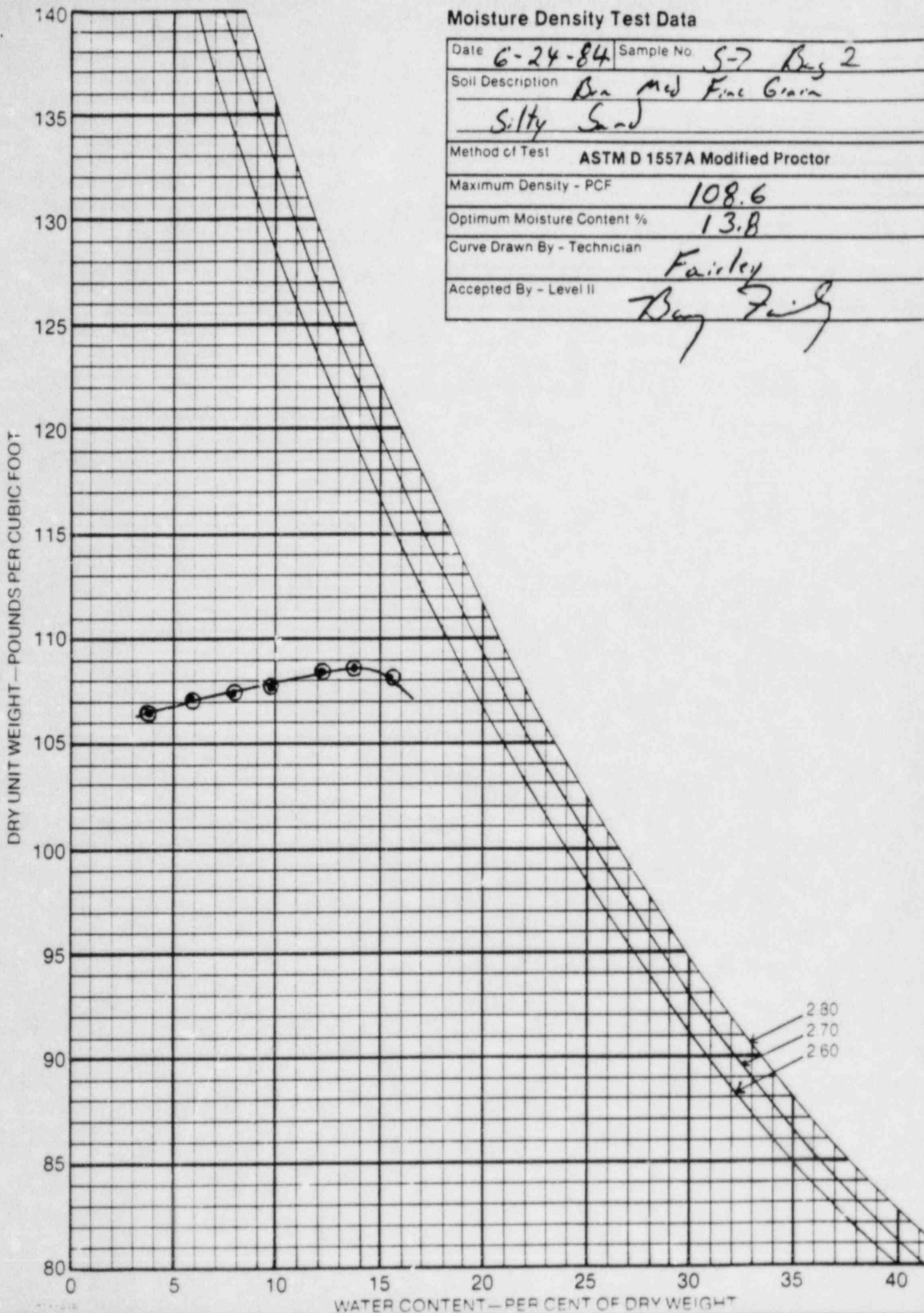
Wash 200 (ASTM D1140) Inspector	L.V. Allen	Scale No.	C-2550	Sieve No.	C378 / C1546
Oven Dry Weight Before Wash (grams)	560.8	Oven Dry Weight After Wash (grams)	542.9	% Passing 200 Sieve	3.3
Sieve Analysis (ASTM D422) Inspector	Copeland	Scale No.	C2550	Oven No.	C292

Sieve Size	Control No.	Cum. Wt. Retained	% Total Retained	% Total Passing
No. 4	C371	0	0	100.0
8	C344	0	0	100.0
16	C343	2.1	0.4	99.6
30	C379	143.4	25.6	74.4
40	C380	266.3	47.5	52.5
50	C860	365.9	65.2	34.8
100	C254	531.7	94.8	5.2
200	C384	543.1	96.8	3.2
Pan	N/A	542.8		
Total	N/A	560.8		

Accepted By: W.C. Eubank 6-25-84
 Level II Date

Moisture Density Test Data

Date	6-24-84	Sample No.	S-7 Bag 2
Soil Description	Dn med Fine Grain Silty Sand		
Method of Test	ASTM D 1557A Modified Proctor		
Maximum Density - PCF	108.6		
Optimum Moisture Content %	13.8		
Curve Drawn By - Technician	Fairley		
Accepted By - Level II	Ben Fink		



Wash 200 and Sieve Analysis

Date	6-24-84	Test No.	S7 BAG 2
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Wash 200 (ASTM D1140) Inspector	Scale No.	Sieve No.
L.V. A/vis	C 2550	C 378 / C 1546
Oven Dry Weight Before Wash (grams)	Oven Dry Weight After Wash (grams)	% Passing 200 Sieve
560.0	518.8	7.97
Sieve Analysis (ASTM D422) Inspector	Scale No.	Oven No.
Copeland	C 2550	C 292

Sieve Size	Control No.	Cum. Wt. Retained	% Total Retained	% Total Passing
No. 4	C 371	C	C	100.0
8	C 344	2.1	.4	99.6
16	C 343	10.8	1.9	98.1
30	C 379	86.2	15.4	84.6
40	C 380	170.5	30.4	69.6
50	C 860	282.4	50.4	49.6
100	C 2514	493.6	88.1	11.9
200	C 384	518.5	92.6	7.4
Pan	N/A	5.8.7		
Total	N/A	560.0		

Accepted By: W.C. Eubank Date: 6-25-84

Level II

Proctor Sheet

Date 6-21-84	Sample Description Tan Med Fine Grain Silt	
Inspector W. Hines Moore	Sand	
Pound Scale Used # C-3371	Gram Scale Used # C-2407	
Proctor No. 59 Bag 2	Hammer Control No. C-2410	
Method D-1557 A	Mold C-2409	Oven C-292

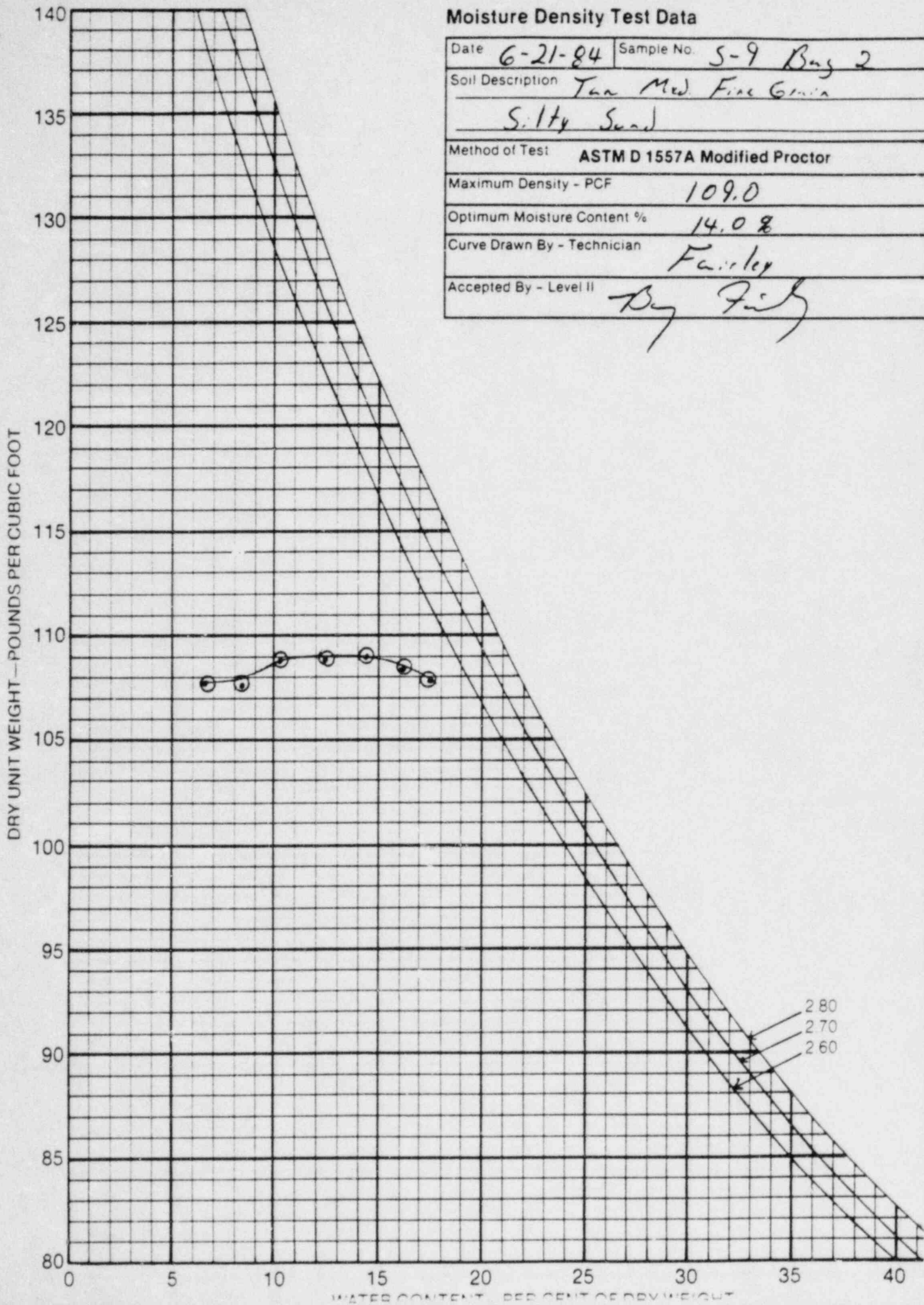
		1	2	3	4	5	6	7
Wet Density Determination	A	Weight Mold (lbs.)	9.36	9.36	9.36	9.36	9.36	9.36
	B	Mold Volume Factor ($\frac{\text{Volume}}{\text{Volume}}$)	30	30	30	30	30	30
	C	Water Added (ml.)	150	200	250	300	350	400
	D	Weight Soil and Mold (lbs.)	13.19	13.25	13.36	13.44	13.52	13.59
Moisture Content Determination	E	Weight of Soil (lbs.) (D - A)	3.83	3.89	4.0	4.08	4.16	4.23
	F	Wet Density (lbs./ft. ³) (B x E)	114.9	116.7	120.0	122.4	124.8	126.9
	G	Tare Number	C-2	Y-1	Y-3	B-1	B-6	B-7
	H	Tare Weight (grams)	49.8	49.2	48.2	48.3	49.9	49.3
	J	Wet Weight Sample + Tare (grams)	250.0	250.0	250.0	250.0	250.0	250.0
	K	Dry Weight Sample + Tare (grams)	237.6	234.5	231.3	227.7	224.6	222.0
	L	Weight of Dry Soil (grams) (K - H)	187.8	185.3	183.1	179.4	174.7	172.7
	M	Weight of Moisture (grams) (J - K)	12.4	15.5	18.7	22.3	25.4	28.0
	N	Percent Moisture (M/L x 100%)	6.6	8.4	10.2	12.4	14.5	16.2
	P	Dry Density (lbs./ft. ³) (F / (N + 100))	107.8	107.7	108.9	109.9	109.0	108.4

Maximum Dry Density (Proctor Density): 109.0 (lbs./ft.³) Optimum Moisture (%): 14.08
(From Curve) (From Curve)

①	②	③	④	Accepted By: <u>Big Fish</u>	⑤	⑥
47.3	49.0	49.3	48	47.5	47.8	49.4
T-3	C-3	Y-2	A-7	P-5	P-6	B-4
250.0	250.0	250.0	250.0	250.0	250.0	250.0
237.2	234.1	231.5	227.5	224.1	221.5	217.0
189.9	185.1	182.2	179.5	176.6	173.7	169.6
12.8	15.9	18.5	22.5	25.9	28.5	31.0
6.7	8.6	10.2	12.5	14.7	16.4	18.3

Moisture Density Test Data

Date	6-21-84	Sample No.	S-9 Bag 2
Soil Description	Tan Med. Fine Gr. Silty Sand		
Method of Test	ASTM D 1557A Modified Proctor		
Maximum Density - PCF	109.0		
Optimum Moisture Content %	14.0 %		
Curve Drawn By - Technician	Fairley		
Accepted By - Level II	By Fairley		



Wash 200 and Sieve Analysis

Date	6-22-84	Test No.	S-9
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Wash 200 (ASTM D1140) Inspector	Robert Mims	Scale No.	C2550	Sieve No.	C1546
Oven Dry Weight Before Wash (grams)	546.2	Oven Dry Weight After Wash (grams)	494.9	% Passing 200 Sieve	9.4
Sieve Analysis (ASTM D422) Inspector	Robert Mims	Scale No.	C2550	Oven No.	C292

Sieve Size	Control No.	Cum. Wt. Retained	% Total Retained	% Total Passing
No. 4	C371	0	0	100
8	C344	0.7	.1	99.9
16	C343	2.8	.5	99.5
30	C379	50.3	9.2	90.8
40	C380	115.2	21.1	78.9
50	C860	268.3	49.1	50.9
100	C2514	476.9	87.3	12.7
200	C384	494.7	90.6 ^{Wt. 6.58%} 50.6	9.4
Pan	NA	494.9		
Total	NA	546.2		

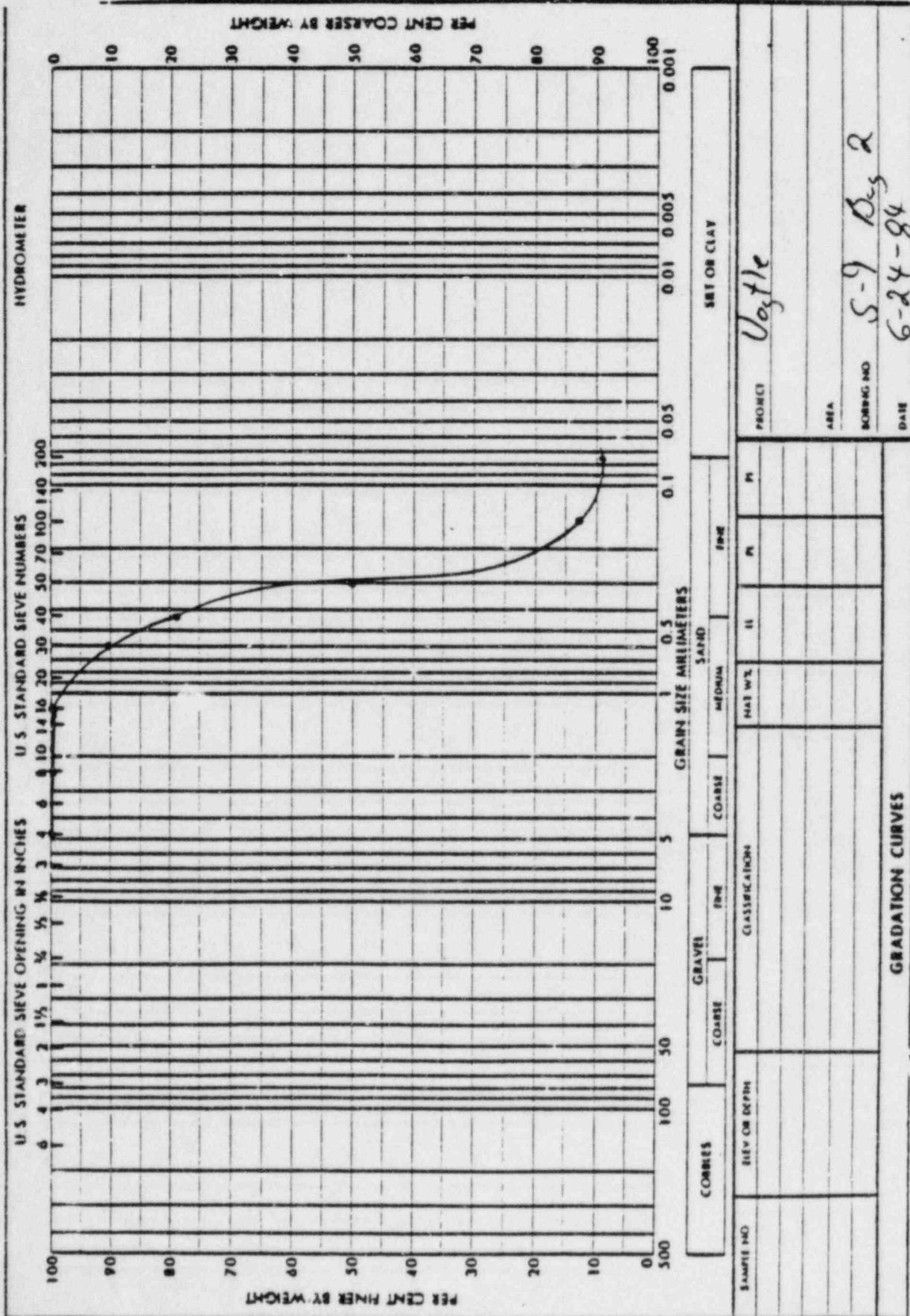
Accepted By:

Ray Fitch

6-25-84

Level II

Date



PROJECT *Ugile*

AREA

BORING NO. *S-9 Bys 2*

DATE *6-24-84*

Proctor Sheet

Date	6-20-84	Sample Description	Reddish Brn Med Grn
Inspector	P. J. Mims Robinson		S. H. S. - J
Pound Scale Used #	C-3371	Gram Scale Used #	C-2407
Proctor No.	S-10 Bng	Hammer Control No.	C-2410
Method	D-1557-A	Mold	C-752
		Oven	C-292
			* C-2409

		1	2	3	4	5	6	7	
Wet Density Determination	A	Weight Mold (lbs.)	9.30	9.30	9.30	9.30	9.36	9.36	
	B	Mold Volume Factor ($\frac{\text{Volume}}{\text{Volume}}$)	30	30	30	30	30	30	
	C	Water Added (ml.)	150	200	250	300	350	400	450
	D	Weight Soil and Mold (lbs.)	13.06	13.13	13.23	13.28	13.35	13.50	13.56
	E	Weight of Soil (lbs.) (D - A)	3.76	3.83	3.93	3.98	4.05	4.14	4.16
	F	Wet Density (lbs./ft. ³) (B x E)	112.8	114.9	117.9	119.4	121.5	124.2	124.8
Moisture Content Determination	G	Tare Number	X-2	X-3	X-4	X-5	C-1	B-5	P-7
	H	Tare Weight (grams)	49.1	49.4	49.0	49.2	49.2	49.7	48.0
	J	Wet Weight Sample + Tare (grams)	250	250	250	250	250	250	250
	K	Dry Weight Sample + Tare (grams)	237.6	234.4	231.0	227.3	225.3	221.5	219.9
	L	Weight of Dry Soil (grams) (K - H)	188.5	185.0	182.0	178.1	176.1	171.8	171.9
	M	Weight of Moisture (grams) (J - K)	12.4	15.6	19.0	22.7	24.7	28.5	30.1
	N	Percent Moisture (M/L) x 100%	6.6	8.4	10.4	12.7	14.0	16.6	17.6
	P	Dry Density (lbs./ft. ³) (F/(N + 100))	105.8	106.0	106.8	105.9	106.6	106.6	106.1

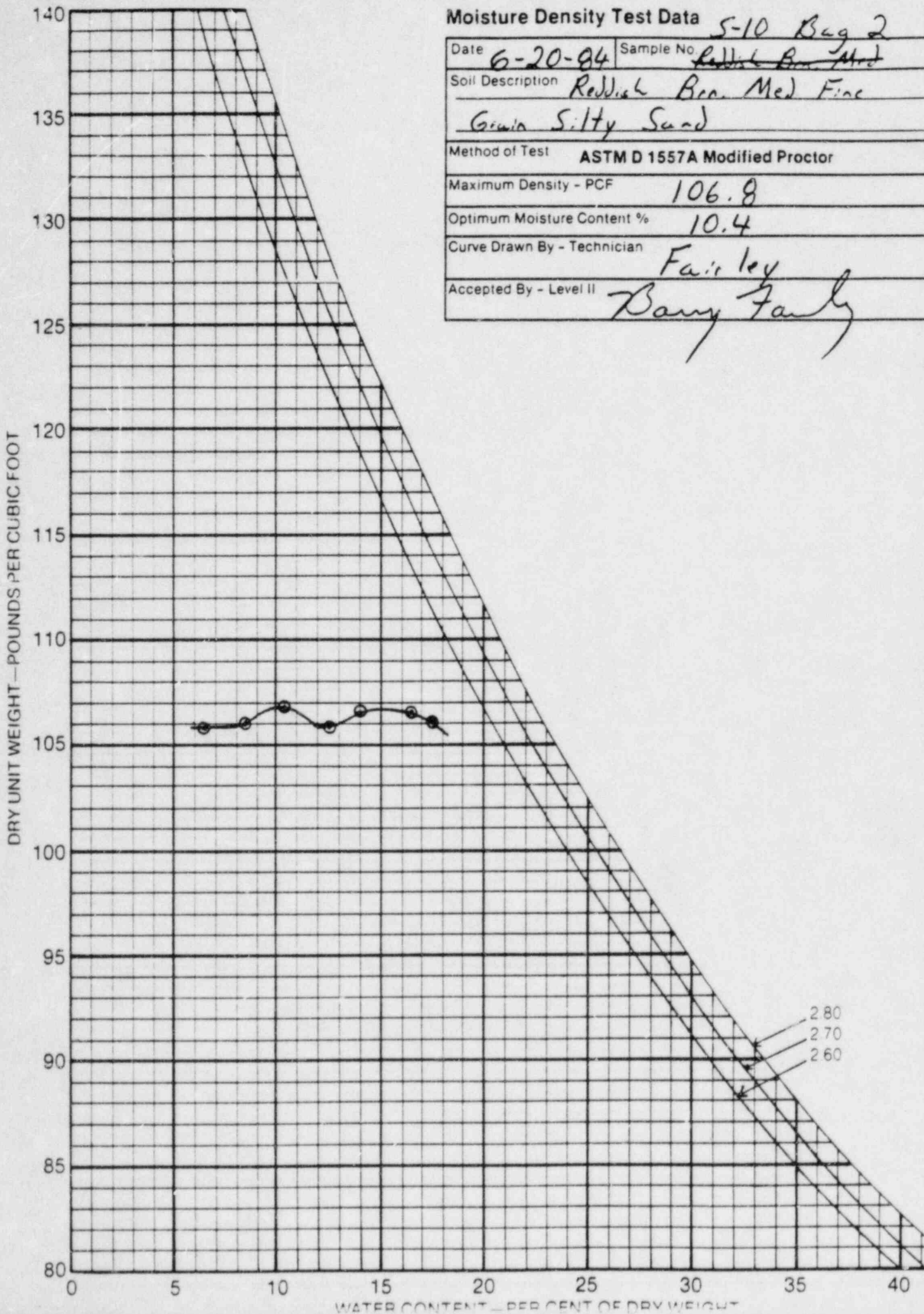
Maximum Dry Density (Proctor Density): 106.8 (lbs./ft.³) Optimum Moisture (%): 10.4
(From Curve) (From Curve)

Accepted By: Bary Fairley

Y-2	Y-3	Y-4	Y-5	C-3	B-4	P-3
250.0	250.0	250.0	250.0	250.0	250.0	250.0
237.2	233.3	230.8	227.0	224.3	222.1	218.7
49.3	48.2	49.1	49.2	49.0	49.4	47.3
187.9	185.1	181.7	177.8	175.3	172.7	171.4
6.8	9.0	10.6	12.4	14.7	16.2	18.3

Moisture Density Test Data *S-10 Bag 2*

Date <i>6-20-84</i>	Sample No. <i>Reddish Br. Med</i>
Soil Description <i>Reddish Br. Med Fine Grain Silty Sand</i>	
Method of Test ASTM D 1557A Modified Proctor	
Maximum Density - PCF	<i>106.8</i>
Optimum Moisture Content %	<i>10.4</i>
Curve Drawn By - Technician	<i>Fairley</i>
Accepted By - Level II	<i>Barry Fairley</i>



Wash 200 and Sieve Analysis

Date	6-24-84	Test No.	S-10 Bag 2
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Wash 200 (ASTM D1140) Inspector	L.V. Almi	Scale No.	C2550	Sieve No.	C378/ C1546
Oven Dry Weight Before Wash (grams)	530.3	Oven Dry Weight After Wash (grams)	501.1	% Passing 200 Sieve	5.85
Sieve Analysis (ASTM D422) Inspector	Cope/and	Scale No.	C2407	Oven No.	C292

Sieve Size	Control No.	Cum. Wt. Retained	% Total Retained	% Total Passing
No. 4	C371	0 2.6 ^{2.6} _{C-25-84}	0	100.0
8	C344	2.6	.5	99.5
16	C343	12.4	2.3	97.7
30	C329	94.5	17.8	82.2
40	C380	187.1	35.3	64.7
50	C860	301.1	56.8	43.2
100	C2514	483.9	91.3	8.7
200	C384	500.6	94.4	5.6
Pan	N/A	501.1		
Total	N/A	530.3		

Accepted By: W.C. Subbush Level II Date: 6-25-84

Proctor Sheet

Date 6-20-84	Sample Description REDDISH BROWN	
Inspector Porter, Mims	MEDIUM TO FINE GRAIN	
Pound Scale Used # C-3371	Gram Scale Used # C-2407	
Proctor No. S-11 BA92	Hammer Control No. C-2410	
Method D 1557A	Mold C-2409	Oven C-292

		1	2	3	4	5	6	7
	A	Weight Mold (lbs.)	9.37	9.37	9.37	9.37	9.37	9.37
	B	Mold Volume Factor ($\frac{\text{Volume}}{\text{Volume}}$)	30	30	30	30	30	30
	C	Water Added (ml.)	100	150	200	250	300	400
Wet Density Determination	D	Weight Soil and Mold (lbs.)	13.27	13.36	13.41	13.49	13.59	13.72
	E	Weight of Soil (lbs.) (D - A)	3.90	3.99	4.04	4.12	4.22	4.35
	F	Wet Density (lbs./ft. ³) (B x E)	117.0	119.7	121.2	123.6	126.6	130.5
Moisture Content Determination	G	Tare Number	R-1	R-2	R-3	R-4	R-5	E-1
	H	Tare Weight (grams)	48.5	48.5	47.9	47.3	47.4	49.2
	J	Wet Weight Sample + Tare (grams)	250.0	250.0	250.0	250.0	250.0	250.0
	K	Dry Weight Sample + Tare (grams)	241.2	237.8	234.8	230.9	228.0	224.9
	L	Weight of Dry Soil (grams) (K - H)	192.7	189.3	186.9	183.6	180.6	175.7
	M	Weight of Moisture (grams) (J - K)	8.8	12.2	15.2	19.1	22.0	25.1
	N	Percent Moisture (M/L) x 100%	4.6	6.4	8.1	10.4	12.2	14.3
	P	Dry Density (lbs./ft. ³) (F/(N + 100))	111.8	112.5	112.1	112.0	112.8	114.2

Maximum Dry Density (Proctor Density): 114.2 (lbs./ft.³) Optimum Moisture (%): 14.3
(From Curve) (From Curve)

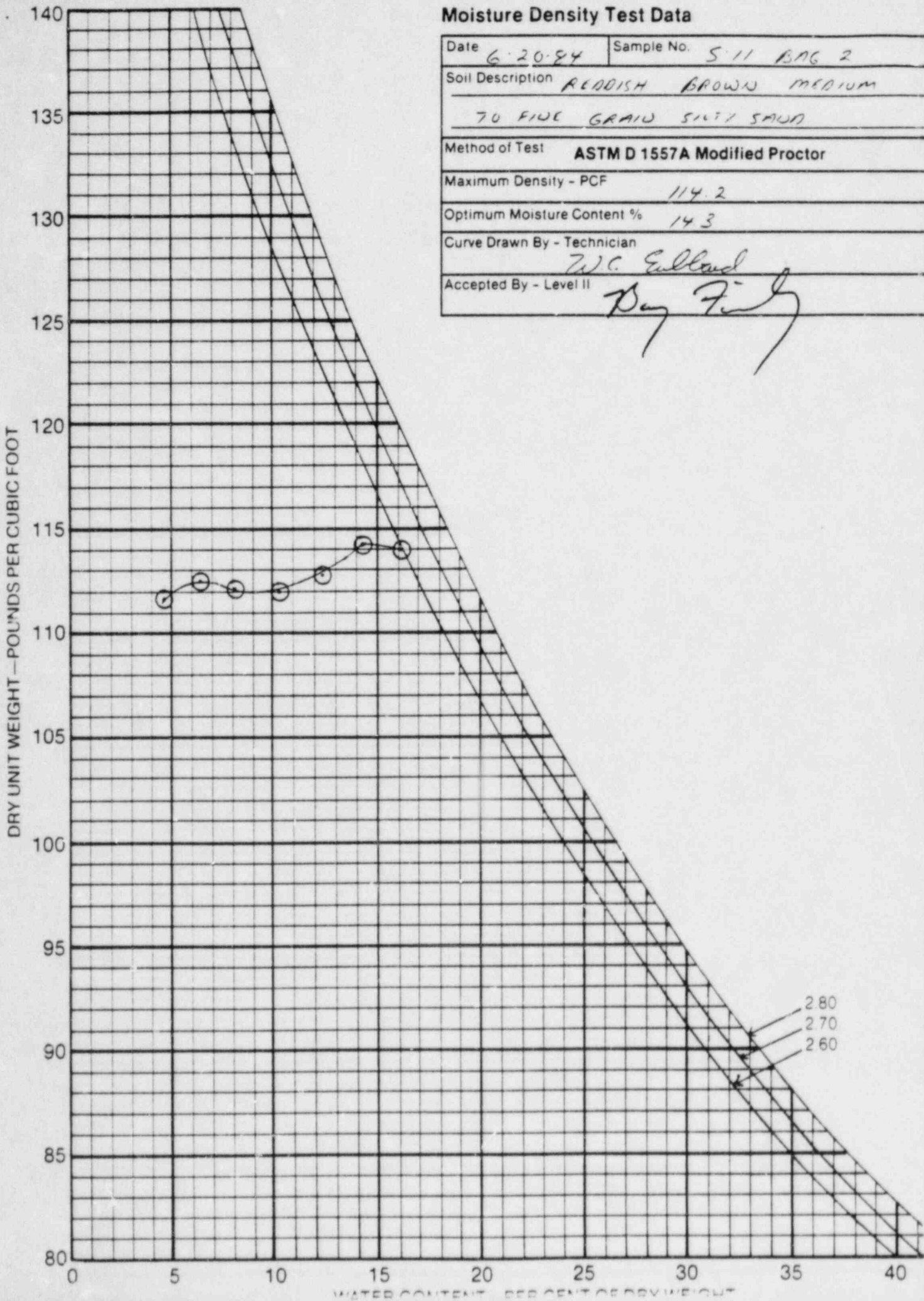
Accepted By: [Signature]

Level II

T-1	T-2	T-3	T-4	T-5	E-3	E-4
250.0	250.0	250.0	250.0	250.0	250.0	250.0
240.9	238.2	234.4	231.0	227.8	224.8	221.6
47.8	48.3	47.3	47.6	48.2	49.9	49.0
193.1	189.9	187.1	183.2	179.6	174.9	172.6
	1.0	0.7	1.4	1.2	1.4	1.4

Moisture Density Test Data

Date	6-20-84	Sample No.	S-11 BAG 2
Soil Description	REDDISH BROWN MEDIUM TO FINE GRAIN SILTY SAND		
Method of Test	ASTM D 1557A Modified Proctor		
Maximum Density - PCF	114.2		
Optimum Moisture Content %	14.3		
Curve Drawn By - Technician	W.C. Euland		
Accepted By - Level II	Dy F...		



Wash 200 and Sieve Analysis

Date	6-22-84	Test No.	S-1
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Wash 200 (ASTM D1140) Inspector	Robert Mims	Scale No.	C2550	Sieve No.	C1546
Oven Dry Weight Before Wash (grams)	512.1	Oven Dry Weight After Wash (grams)	462.8	% Passing 200 Sieve	9.6
Sieve Analysis (ASTM D422) Inspector	Robert Mims	Scale No.	C2550	Oven No.	C292

Sieve Size	Control No.	Cum. Wt. Retained	% Total Retained	% Total Passing
No. 4	C371	0	0	100
8	C344	4.9	1.0	99.0
16	C343	28.7	5.6	94.4
30	C379	86.7	16.9	83.1
40	C350	164.6	32.1	67.9
50	C860	303.1	59.2	43.8
100	C2514	437.3	85.4	14.6
200	C364	462.3	90.3	9.7
Pan	NA	462.7		
Total	NA	512.1		

Accepted By:

Bay Fink

Level II

6-24-84

Date

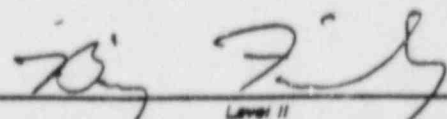
Proctor Sheet

Date	6-20-84	Sample Description	DARK RED CLAY GRAIN
Inspector	Peter C. Mims		Silty SAND
Pound Scale Used #	C-3371	Gram Scale Used #	C-2407
Proctor No.	S-12 - BAG 2	Hammer Control No.	C-2410
Method	D 1557 A	Mold	C-752
		Given	C-292

		1	2	3	4	5	6	7
Wet Density Determination	A	Weight Mold (lbs.)	9.30	9.30	9.30	9.30	9.30	9.30
	B	Mold Volume Factor (Volume)	30	30	30	30	30	30
	C	Water Added (ml.)	100	150	200	250	300	350
	D	Weight Soil and Mold (lbs.)	13.08	13.20	13.28	13.32	13.43	13.48
	E	Weight of Soil (lbs.) (D - A)	3.78	3.90	3.98	4.02	4.13	4.18
	F	Wet Density (lbs./ft. ³) (B x E)	113.4	117.0	119.4	120.6	123.9	125.4
Moisture Content Determination	G	Tare Number	AA-1	AA-2	AA-3	AA-4	AA-5	AA-6
	H	Tare Weight (grams)	478	479	48.5	47.6	47.9	46.8
	J	Wet Weight Sample + Tare (grams)	250.0	250.0	250.0	250.0	250.0	250.0
	K	Dry Weight Sample + Tare (grams)	240.9	237.4	234.0	230.5	227.4	224.6
	L	Weight of Dry Soil (grams) (K - H)	193.1	189.5	185.5	182.9	179.5	177.8
	M	Weight of Moisture (grams) (J - K)	9.1	12.6	16.0	19.5	22.6	25.4
	N	Percent Moisture (M/L) x 100%	4.7	6.6	8.6	10.7	12.6	14.3
	P	Dry Density (lbs./ft. ³) (F/(N + 100))	108.3	109.8	109.9	108.9	110.0	109.7

Maximum Dry Density (Proctor Density): 110.1 (lbs./ft.³) Optimum Moisture (%): 13.5
(From Curve) (From Curve)

Accepted By:

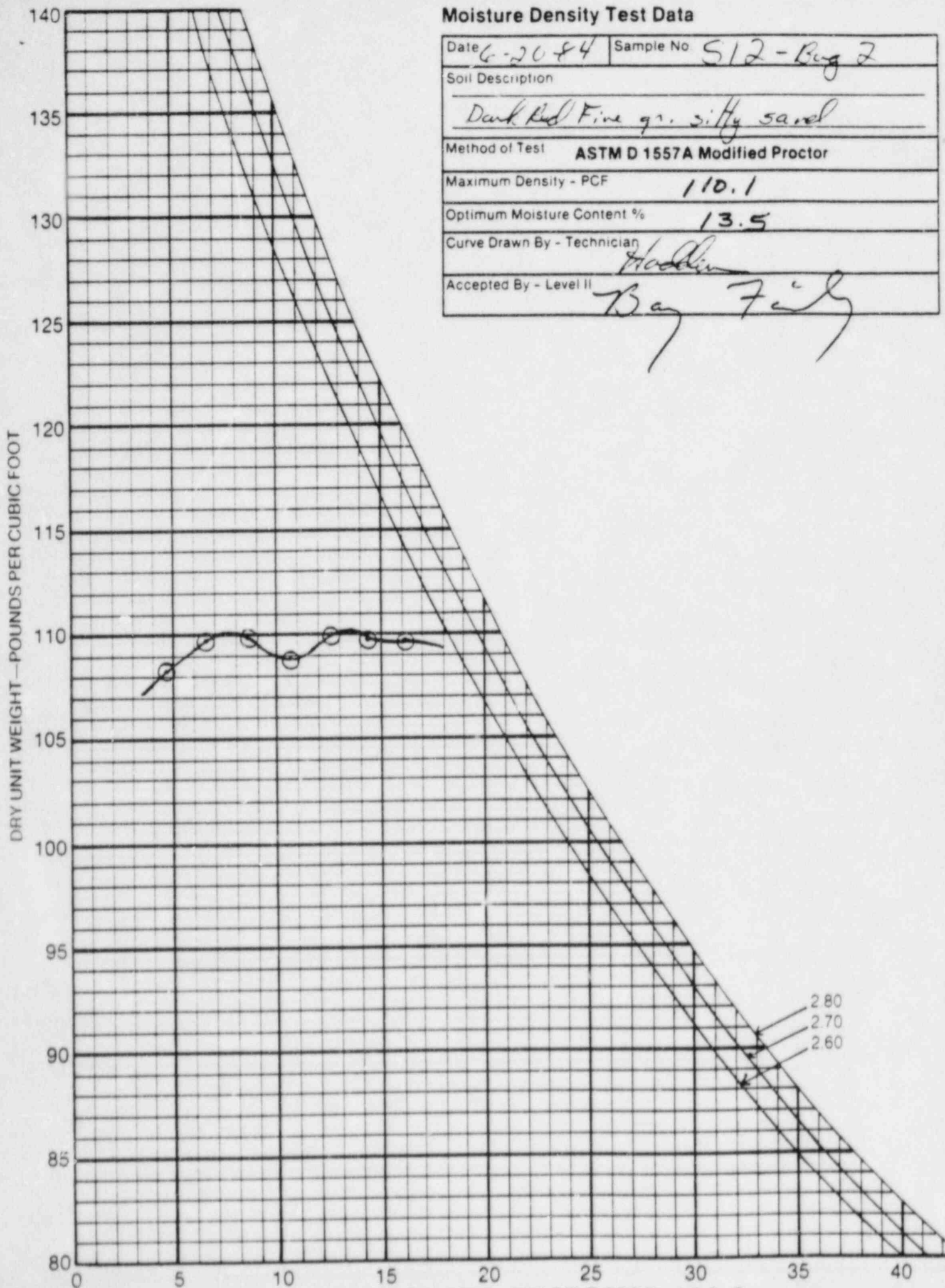


Level II

BB-1	BB-2	BB-3	BB-4	BB-5	BB-6	BB-7
250.0	250.0	250.0	250.0	250.0	250.0	250.0
240.5	237.3	234.6	230.3	226.7	224.5	221.6
49.2	49.0	48.4	48.9	49.2	49.0	45.5
191.3	189.3	186.2	181.4	177.5	175.5	176.1
9.5	12.7	15.4	19.7	23.3	25.5	28.4
5.0	6.7	8.3	10.9	13.1	14.5	16.1

Moisture Density Test Data

Date	6-20-84	Sample No	512-Bag 2
Soil Description			
Dark Red Fine gr. silty sand			
Method of Test			
ASTM D 1557A Modified Proctor			
Maximum Density - PCF			
110.1			
Optimum Moisture Content %			
13.5			
Curve Drawn By - Technician			
Hadden			
Accepted By - Level II			
Bay Field			



Wash 200 and Sieve Analysis

Date 6-22-84 Test No. S-12

Wash 200 (ASTM D1140) Inspector <u>Robert Mims</u>	Scale No. <u>C2550</u>	Sieve No. <u>C1546</u>
Oven Dry Weight Before Wash (grams) <u>545.4</u>	Oven Dry Weight After Wash (grams) <u>494.7</u>	% Passing 200 Sieve <u>9.3</u>
Sieve Analysis (ASTM D422) Inspector <u>Robert Mims</u>	Scale No. <u>C2550</u>	Oven No. <u>C292</u>

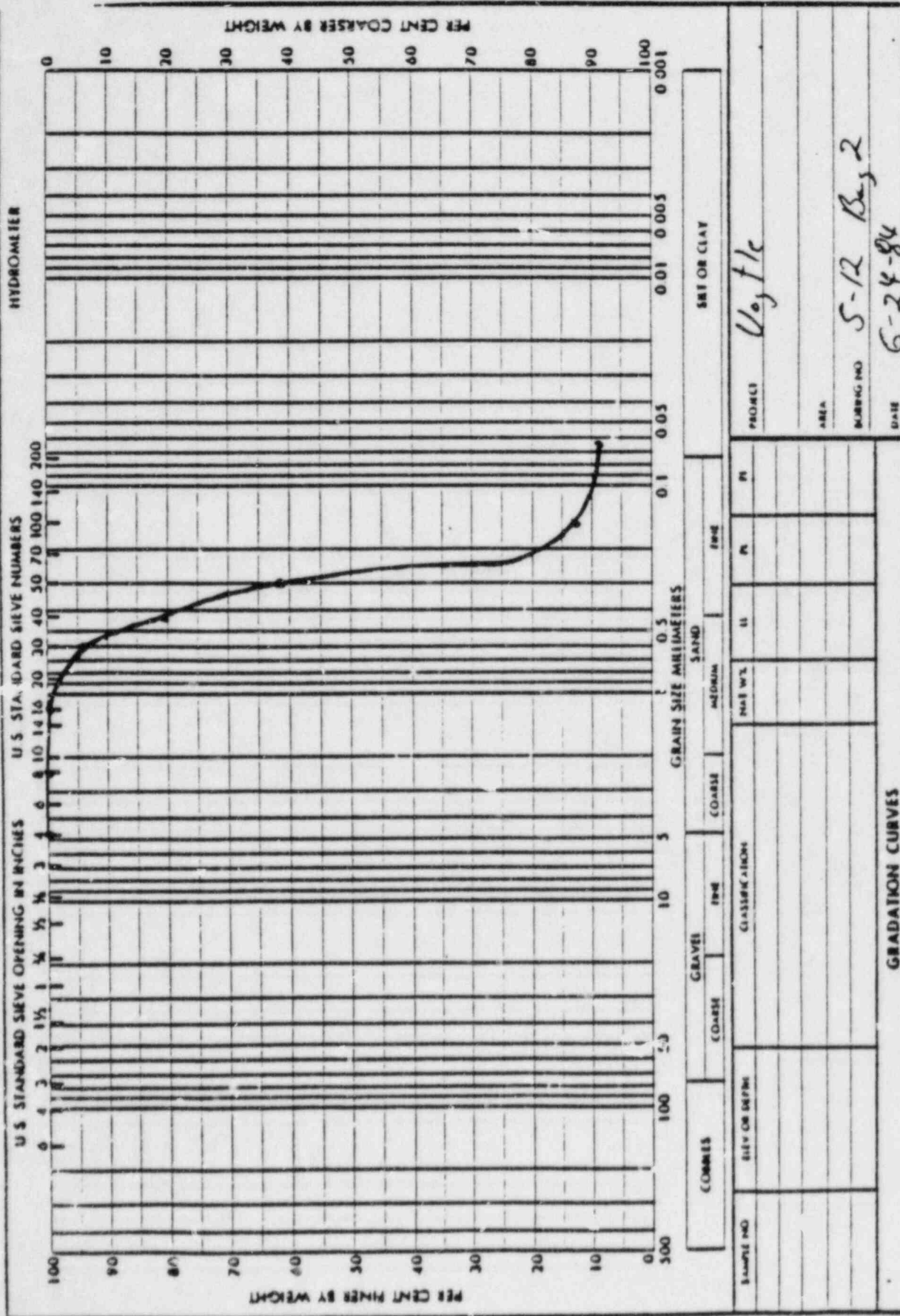
Sieve Size	Control No.	Cum. Wt. Retained	% Total Retained	% Total Passing
No. 4	C371	0	0	100
8	C344	0	0	100
16	C343	0.9	.2	99.8
30	C379	33.5	6.1	93.9
40	C380	103.9	19.1	80.9
50	C860	200.6	36.8	63.2
100	C2514	472.2	86.6	13.4
200	C384	494.5	90.7	9.3
Pan	NA	494.7		
Total	NA	545.4		

Accepted By: _____

Level II

Date

Ray Fitch 6-24-84



Proctor Sheet

Date 6-20-84	Sample Description REDISH TO TAN	
Inspector Patterson, MIMS	FINE GRAIN SILTY SAND	
Pound Scale Used # C-3371	Gram Scale Used # C-2407	
Proctor No. 513 BAG 2	Hammer Control No. C-2410	
Method D1557A	Mold C-2409	Gven C-292

		1	2	3	4	5	6	7
Wet Density Determination	A	Weight Mold (lbs.)	9.37	9.37	9.37	9.37	9.37	9.37
	B	Mold Volume Factor ($\frac{1}{\text{Volume}}$)	30	30	30	30	30	30
	C	Water Added (ml.)	100	150	200	250	300	400
	D	Weight Soil and Mold (lbs.)	13.13	13.23	13.30	13.34	13.49	13.56
	E	Weight of Soil (lbs.) (D - A)	3.76	3.86	3.93	3.97	4.12	4.19
	F	Wet Density (lbs./ft. ³) (B x E)	112.8	115.8	117.9	119.1	123.6	125.7
Moisture Content Determination	G	Tare Number	A-1	A-2	A-3	A-4	A-5	A-6
	H	Tare Weight (grams)	49.9	47.8	46.9	48.5	47.9	48.5
	J	Wet Weight Sample + Tare (grams)	250.0	250.0	250.0	250.0	250.0	250.0
	K	Dry Weight Sample + Tare (grams)	240.6	236.5	233.0	230.0	226.7	223.5
	L	Weight of Dry Soil (grams) (K - H)	190.7	188.7	186.1	181.5	178.8	175.0
	M	Weight of Moisture (grams) (J - K)	9.4	13.5	17.0	20.0	23.3	26.5
	N	Percent Moisture (M/L) x 100%	4.9	7.2	9.1	11.0	13.0	15.1
	P	Dry Density (lbs./ft. ³) (F/(N + 100))	107.5	108.0	108.1	107.3	109.4	109.2

Maximum Dry Density (Proctor Density): 109.5 (lbs./ft.³) Optimum Moisture (%): 13.5
(From Curve) (From Curve)

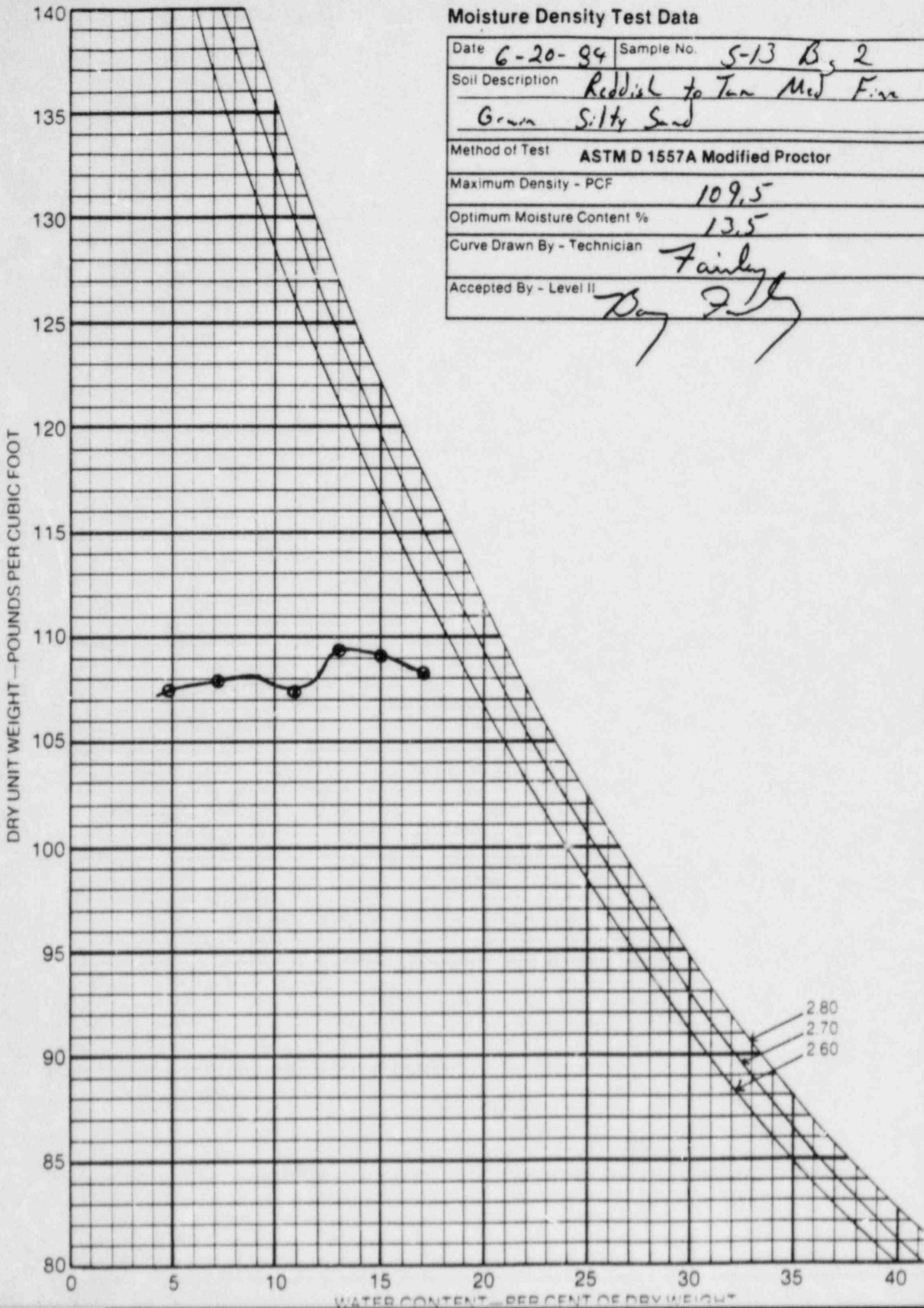
Accepted By:

Ben Fink
Level II

B-1	B-2	B-3	B-4	B-5	B-6	B-7
250	250	250	250	250	250	250
240.5	236.5	232.5	230.0	226.1	223.5	220.0
48.3	49.1	48.3	49.4	49.7	49.9	49.3
192.2	187.4	184.2	20.0	176.4	173.6	170.7
9.5	13.5	17.5	180.6	23.9	26.5	30
4.9	7.2	9.5	11.0	13.5	15.3	17.6

Moisture Density Test Data

Date	6-20-84	Sample No.	S-13 B, 2
Soil Description	Reddish to Tan Med Fine Grain Silty Sand		
Method of Test	ASTM D 1557A Modified Proctor		
Maximum Density - PCF	109.5		
Optimum Moisture Content %	13.5		
Curve Drawn By - Technician	Fairley		
Accepted By - Level II	Dey [Signature]		



Wash 200 and Sieve Analysis

Date	6-22-84	Test No.	S 13
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Wash 200 (ASTM D1140) Inspector	Robert Mims	Scale No.	C2550	Sieve No.	C1546
Oven Dry Weight Before Wash (grams)	533.1	Oven Dry Weight After Wash (grams)	483.1	% Passing 200 Sieve	9.4
Sieve Analysis (ASTM D422) Inspector	Robert Mims	Scale No.	C2550	Oven No.	C292

Sieve Size	Control No.	Cum. Wt. Retained	% Total Retained	% Total Passing
No. 4	C371	0	0	100
8	C344	0.5	.1	99.9
16	C343	3.2	.6	99.4
30	C379	55.3	10.4	89.6
40	C380	123.3	23.1	76.9
50	C360	273.9	51.4	48.6
100	C25.14	466.5	87.5	RM 6-22-84 12.5
200	C384	482.7	90.5	9.5
Par.	NA	483.1	RM 6-22-84	
Total	NA	533.1		

Accepted By: Barry Fair Level II Date: 6-24-84

