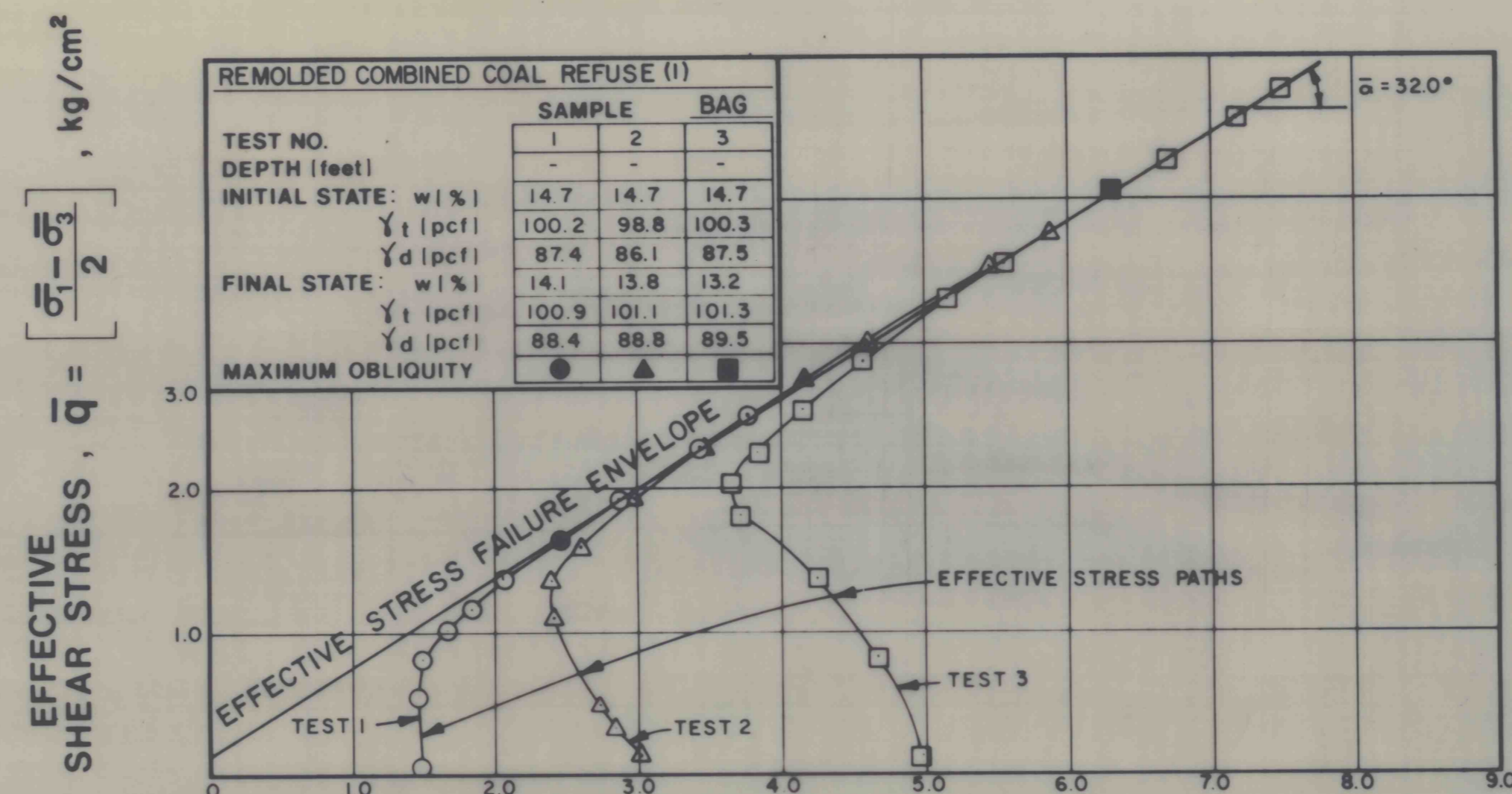


EFFECTIVE MEAN NORMAL STRESS, $\bar{p} = \frac{\sigma_1 + \sigma_3}{2}$, kg/cm²

TEST PARAMETERS			
TEST NO	4	5	
STRAIN RATE (in./min.)	0.0016	0.0018	
BACK PRESSURE (psi)	5.01	5.04	
CONSOLIDATION TIME (days)			

SAMPLE DIMENSIONS			
DIAMETER (inches)	2.87	2.87	
LENGTH (inches)	5.68	5.54	

NATURAL SOIL



EFFECTIVE MEAN NORMAL STRESS, $\bar{p} = \frac{\sigma_1 + \sigma_3}{2}$, kg/cm²

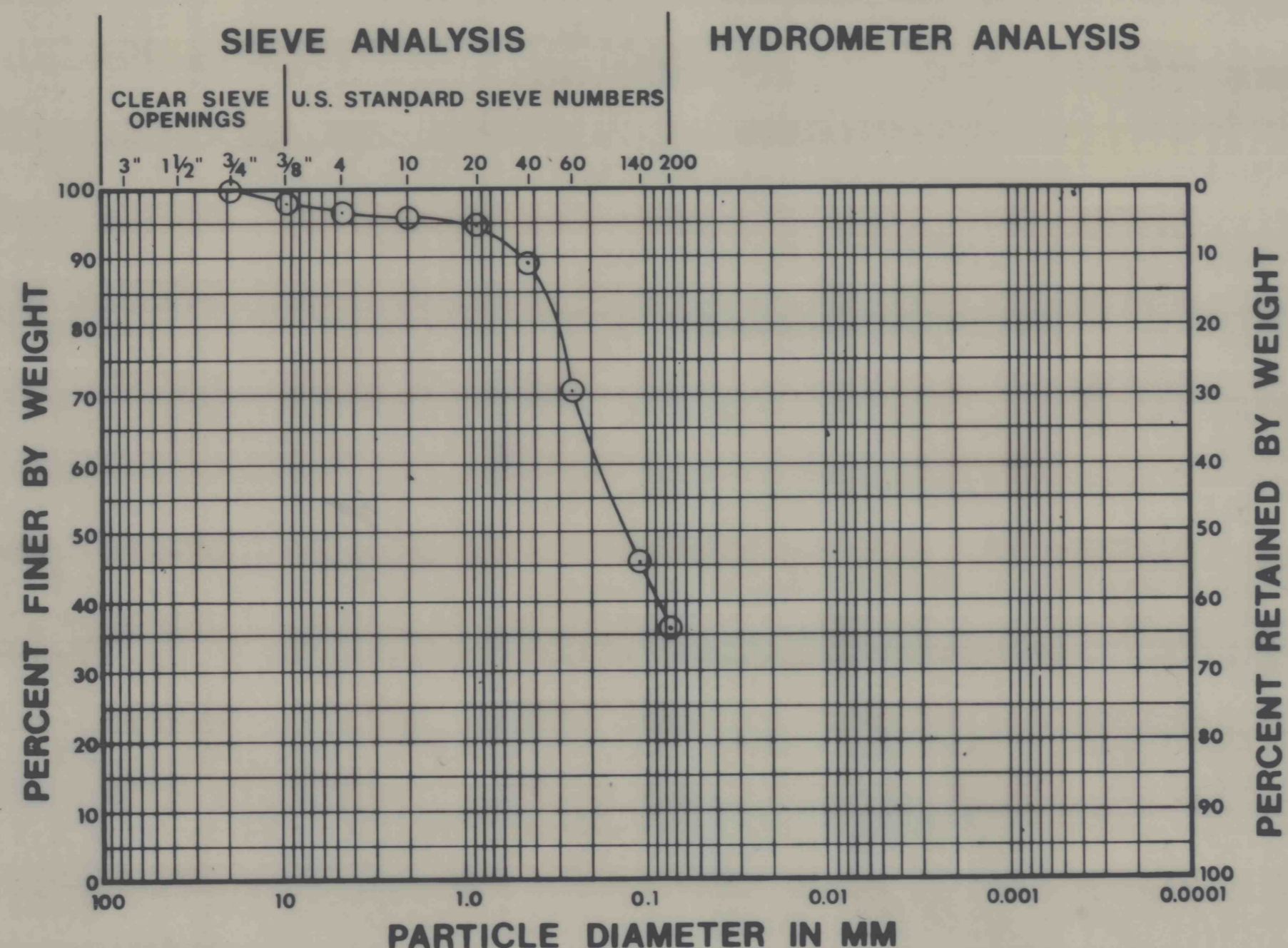
TEST PARAMETERS			
TEST NO	1	2	3
STRAIN RATE (in./min.)	0.0016	0.0018	0.0016
BACK PRESSURE (psi)	3.97	4.05	4.06
CONSOLIDATION TIME (days)			

SAMPLE DIMENSIONS			
DIAMETER (inches)	2.87	2.87	2.87
LENGTH (inches)	5.60	5.60	5.60

(1) THE COMBINED COAL REFUSE SAMPLE WAS REMOLDED BY COMPACTING THE MATERIAL TO 90% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY.

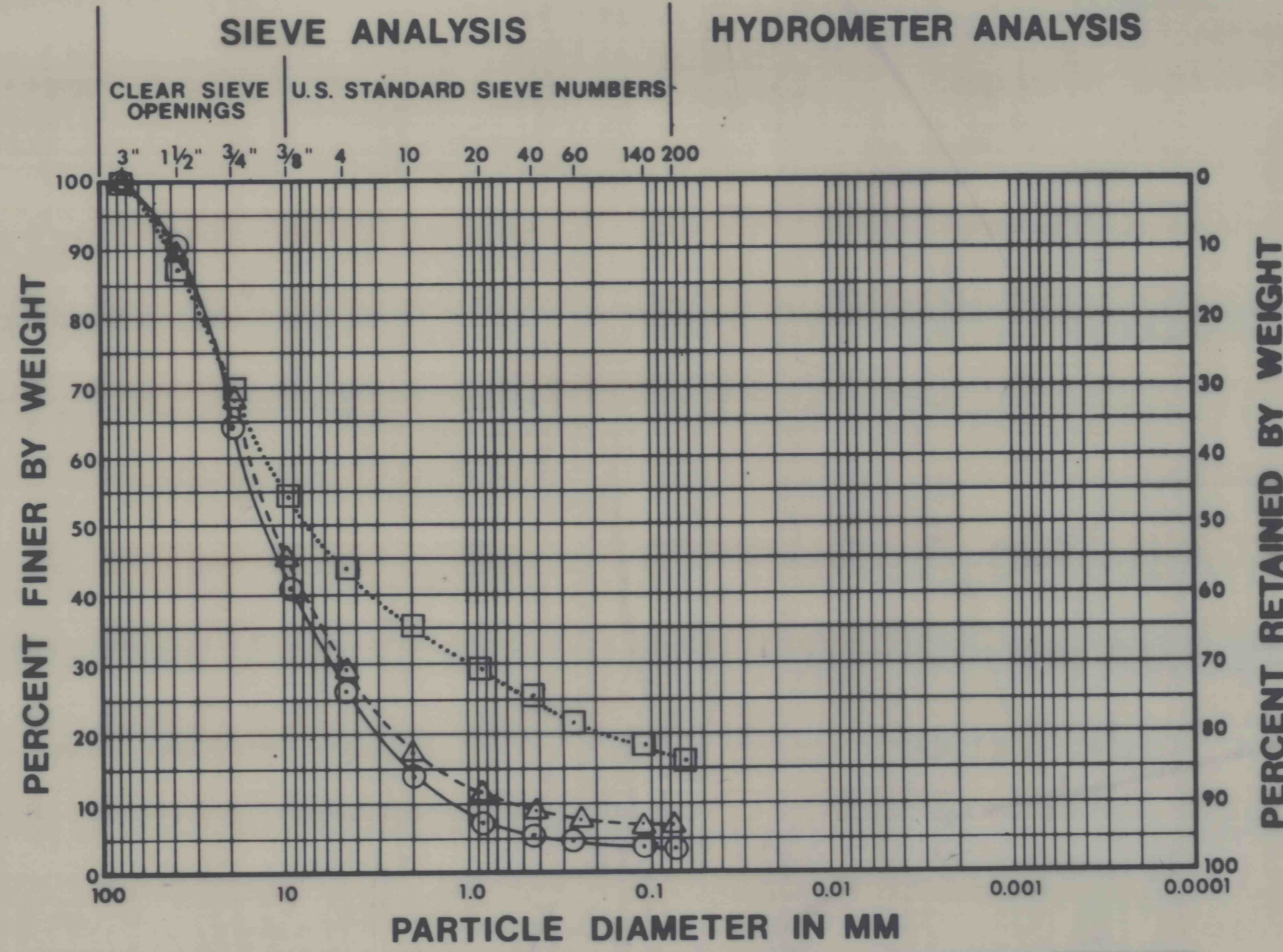
COMBINED COAL REFUSE

CONSOLIDATED UNDRAINED TRIAXIAL STRENGTH TESTS WITH PORE PRESSURE MEASUREMENTS



COBBLES		GRAVEL		SAND				SILT AND CLAY FRACTION			
		coarse	fine	coarse	medium	fine					
SYMBOL	TEST PIT	SAMPLE	DEPTH	SOIL DESCRIPTION				U.S.C.S.	D ₁₀	C _u	W, %
○	DPT-1	BAG	6.0' - 8.5'	CLAYEY SAND				SC	-	-	-

NATURAL SOIL

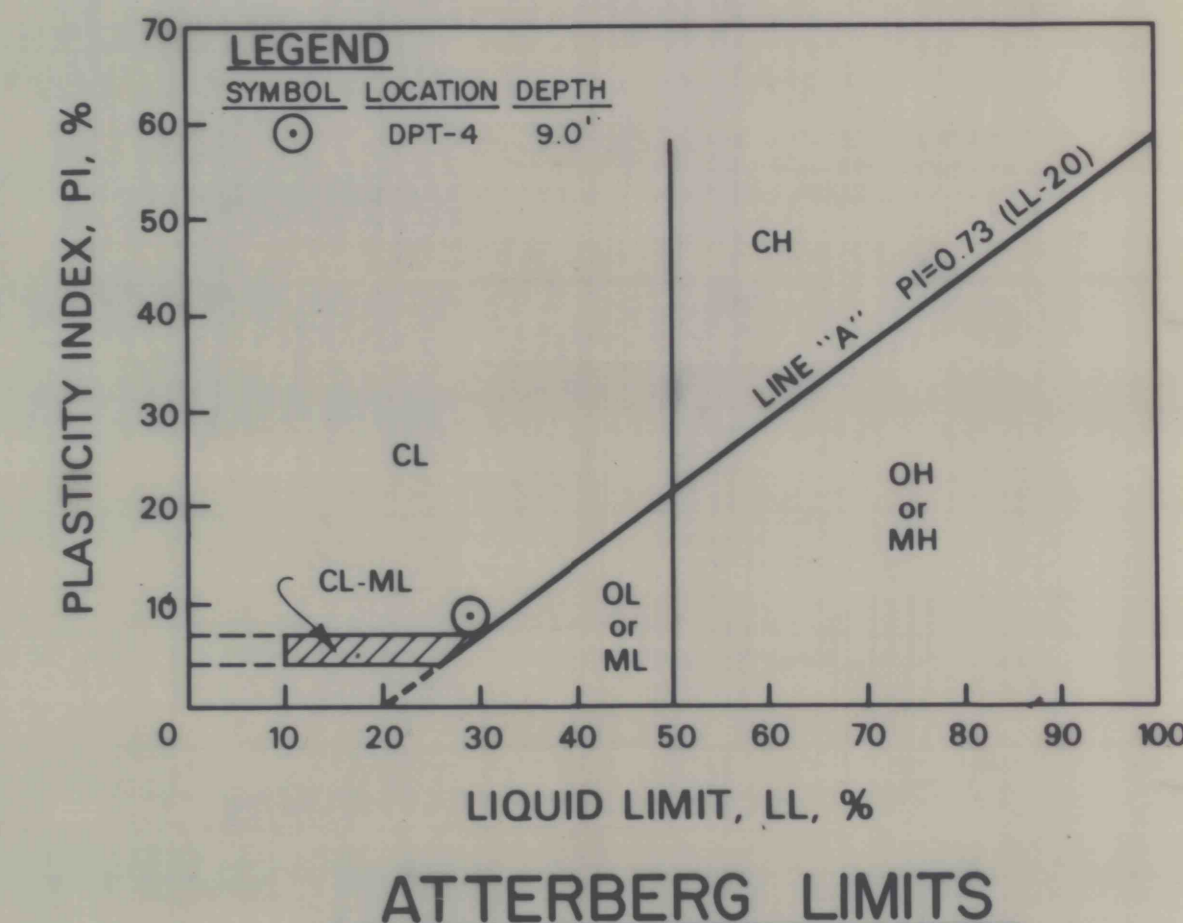


COBBLES		GRAVEL		SAND				SILT AND CLAY FRACTION			
		coarse	fine	coarse	medium	fine					
SYMBOL	BORING	SAMPLE	DEPTH	SOIL DESCRIPTION				U.S.C.S.	D ₁₀	C _u	W, %
○	—	SURFACE	—	COMBINED COAL REFUSE (10-7-77)				-	-	-	-
△	—	SURFACE	—	COMBINED COAL REFUSE (12-13-77)				-	-	-	-
□	—	C-1	—	COMBINED COAL REFUSE (9-22-80)				-	-	-	-

COMBINED COAL REFUSE

GRAIN SIZE ANALYSIS

SILTS AND CLAYS		ML	INORGANIC SILTS, VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS
LIQUID LIMIT 50% OR LESS		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDS OR SILTS, ELASTIC SILTS
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
		OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY

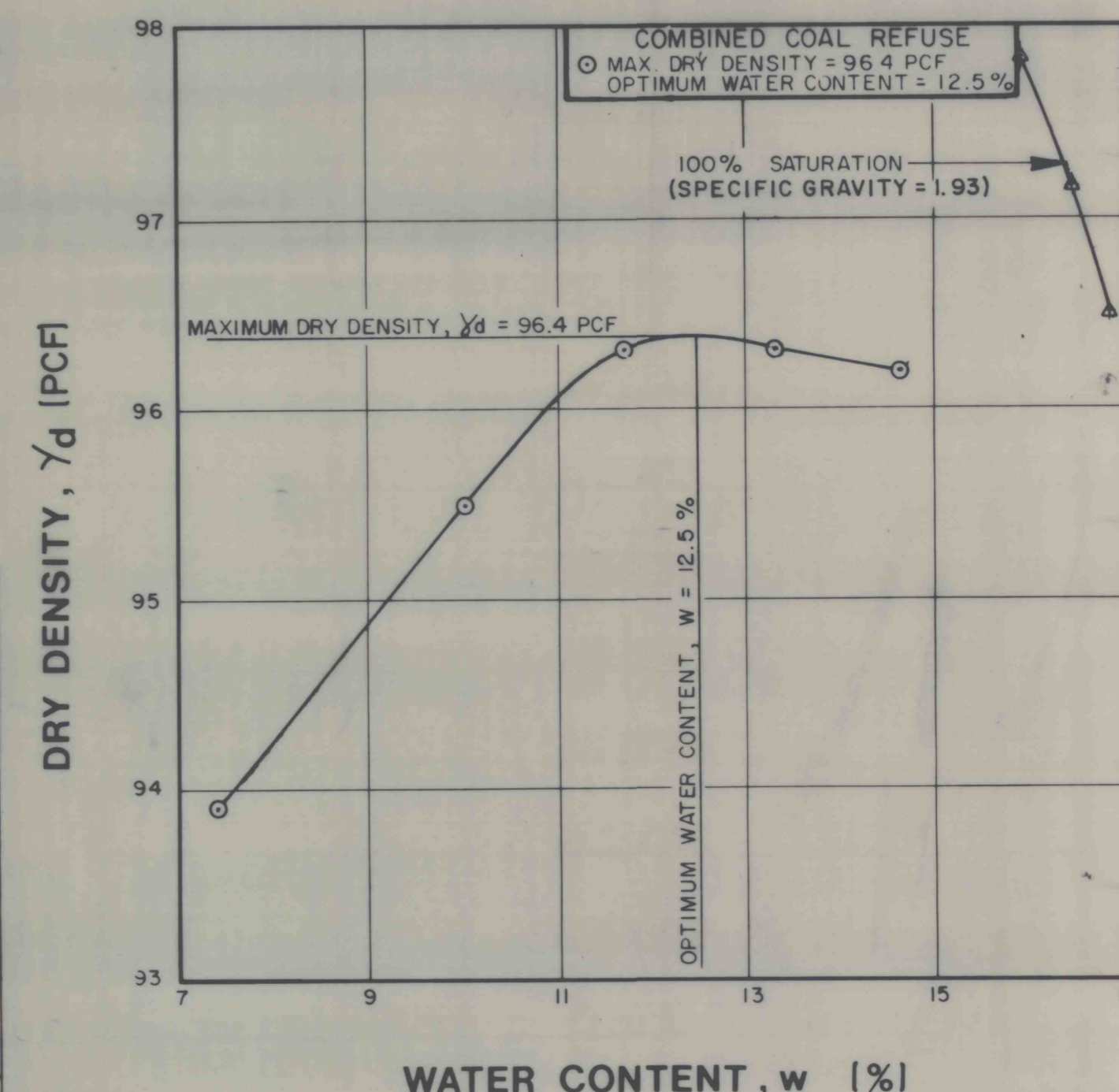


ATTERBERG LIMITS

ASTM DESIGNATION	HAM/DROP	LAYERS
STANDARD D698	5.5" / 12"	3
MODIFIED D1557	10" / 18"	5

METHOD**	MATERIAL SIZE	MOLD SIZE	BLOWS*
A	ALL PASSING #4	4 DIA.	25
B	ALL PASSING #4	6 DIA.	56
C	ALL PASSING #4	4 DIA.	25
D	ALL PASSING #4	6 DIA.	56

ENGINEERING PROPERTIES OF MATERIALS						
LOCATION	DEPTH (ft)	DESCRIPTION	SPECIFIC GRAVITY	DRY DENSITY (pcf)	WATER CONTENT (%)	
Test Pit DPT 1	3.0-3.7	Brown Fine to Medium Sand with Trace of Silt	-	109.6(1)	20.9	
Test Pit DPT 1	6.9-7.4	Gray Clayey Fine to Coarse Sand with Some Rock Fragments	-	87.8(2)	34.6	
Test Pit DPT 1	7.4-7.9	Gray Clayey Fine to Coarse Sand with Some Rock Fragments	-	88.4(2)	34.6	
Test Pit DPT 1	12.4-12.9	Gray Silty Fine Sand with Some Clay and Rock Fragments	-	112.5(2)	15.9	
Test Pit DPT 2	3.0-3.7	Brown Silty Fine to Medium Sand	-	115.5(1)	15.7	
Test Pit DPT 2	5.0-5.7	Brown Silty Fine to Medium Sand	-	99.2(1)	19.9	
Test Pit DPT 2	6.5-7.2	Brown Silty Fine to Medium Sand	-	110.8(1)	19.7	
Test Pit DPT 3	0.5-1.2	Brown Silty Fine to Medium Sand	-	111.9(1)	13.9	
Test Pit DPT 3	2.0-2.7	Brown Silty Fine to Medium Sand	-	108.4(1)	8.7	
Test Pit DPT 3	5.0-5.7	Brown Silty Fine to Medium Sand	-	118.6(1)	13.4	
Test Pit DPT 3	9.0-9.7	Gray Sandy Clay	-	91.6(1)	31.2	
Test Pit DPT 4	8.8-9.3	Gray Clay with Some Fine Sand and Rock Fragments	-	102.9(2)	23.1	
Boring 1 ST-1-1	20.3-21.6	Loose to Medium Dense Dark Gray Fine to Coarse Coal Refuse with Some Shale and Coal Fragments	1.77	86.3	14.0	
Embayment 12-13-77-1	Surface	Combined Coal Refuse	2.09	96.3	13.3	



WATER CONTENT, w (%)

COMPACTION TEST

DRAWING NO.	SHEET NO.	FIGURE NO.
B77-801-E13	10 OF 12	6

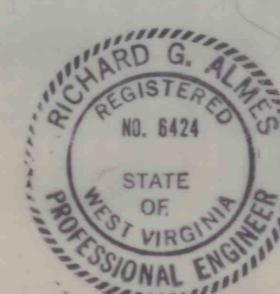
LABORATORY TEST DATA

COAL REFUSE DISPOSAL FACILITY
MINE NO. 81
BETHLEHEM MINES CORPORATION
DRENNEN, WEST VIRGINIA

PREPARED FOR

BETHLEHEM MINES CORPORATION
NICHOLAS DIVISION
CHARLESTON, WEST VIRGINIA

D'APPOLONIA



(1) In-place field density test result.
(2) Laboratory unit weight test result.