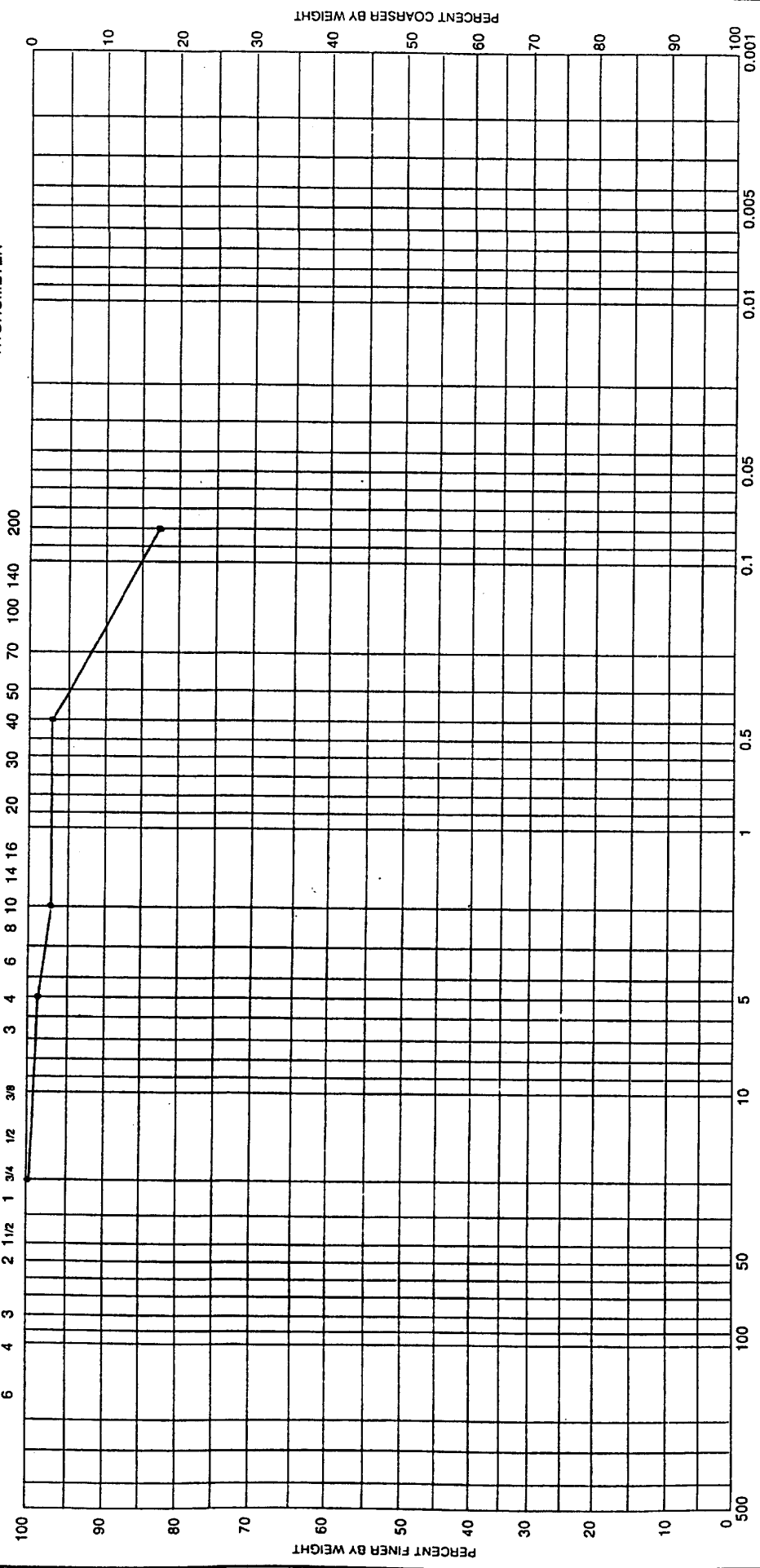


U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

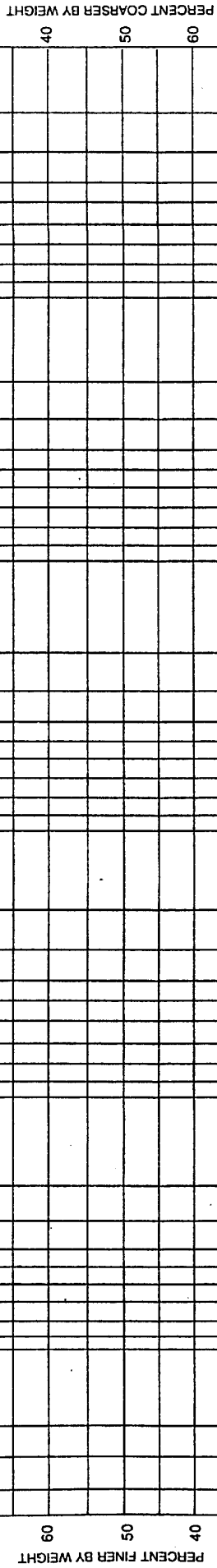
Sample No.	Elev or Depth	GRAVEL				SAND			SILT OR CLAY		
		COARSE	FINE	COARSE	FINE	NET W %	LL	PL	PI	Area	Boring No.
TB-1-4	20'					34	18	16			
Classification											
Sandy Clay: Reddish Tan											
w/Scattered Calcareous Nodules											
(8%) Stiff, Dry (CL)											
Project: Amarillo MSWLF											
Area											
Boring No. TB-1											
Date 7-5-94											

GRADATION CURVES

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



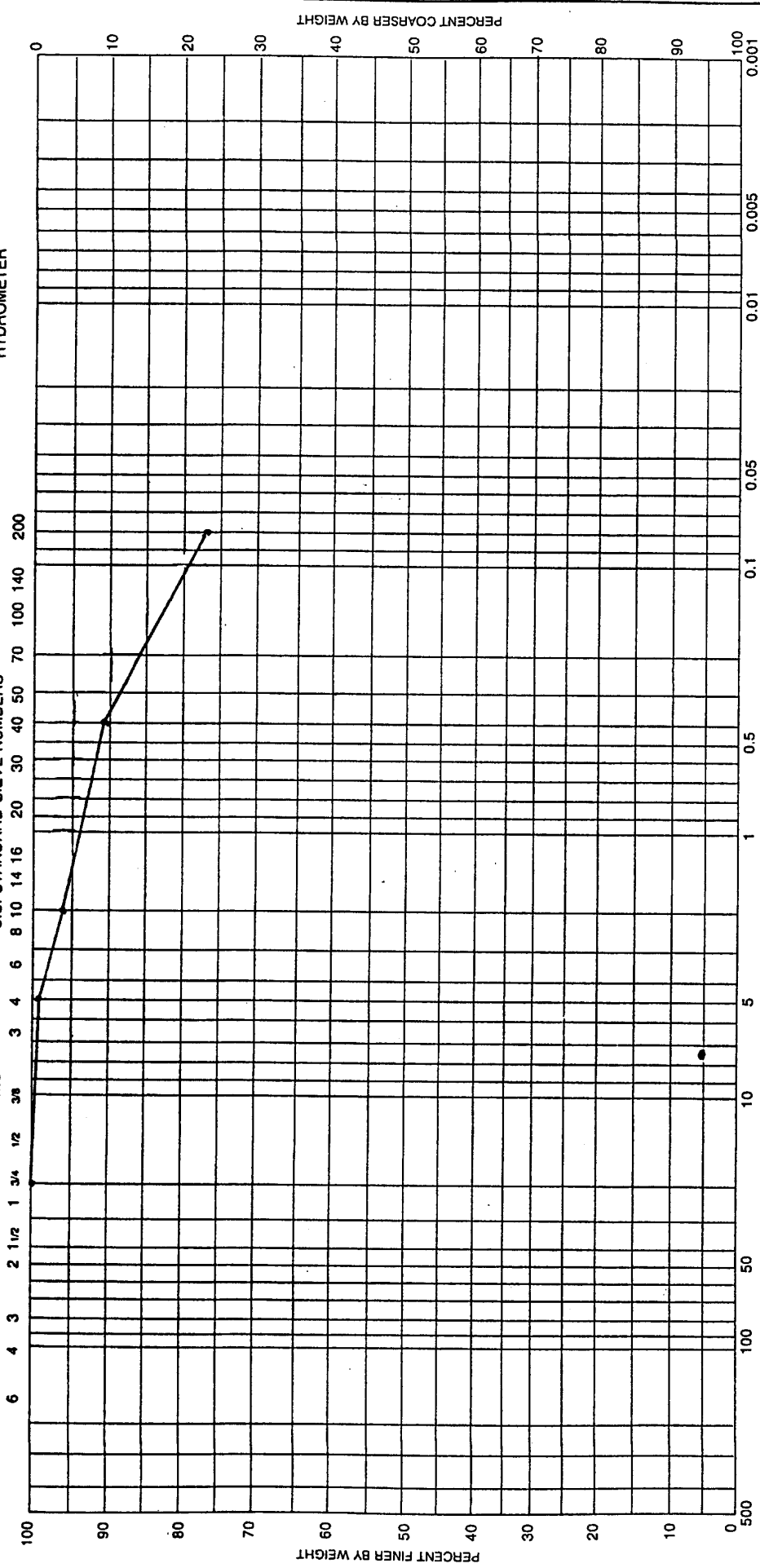
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	NEUTRAL	FINE	

Sample No. TB-1-5	Elev or Depth 25'	Classification Sandy Clay: Reddish Tan w/Scattered Calcareous Nodules (8%) Stiff, Dry (CL)	Net w %	LL	PL	PI	Project Amarillo MSWLF
			26	15	11		Area
							Boring No. TB-1
GRADATION CURVES							Date 7-5-94

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



GRAIN SIZE IN MILLIMETERS

COBBLES		GRAVEL		SAND			SILT OR CLAY		
COARSE	FINE	COARSE	FINE	NEUTRAL	FINE	LL	PL	PI	

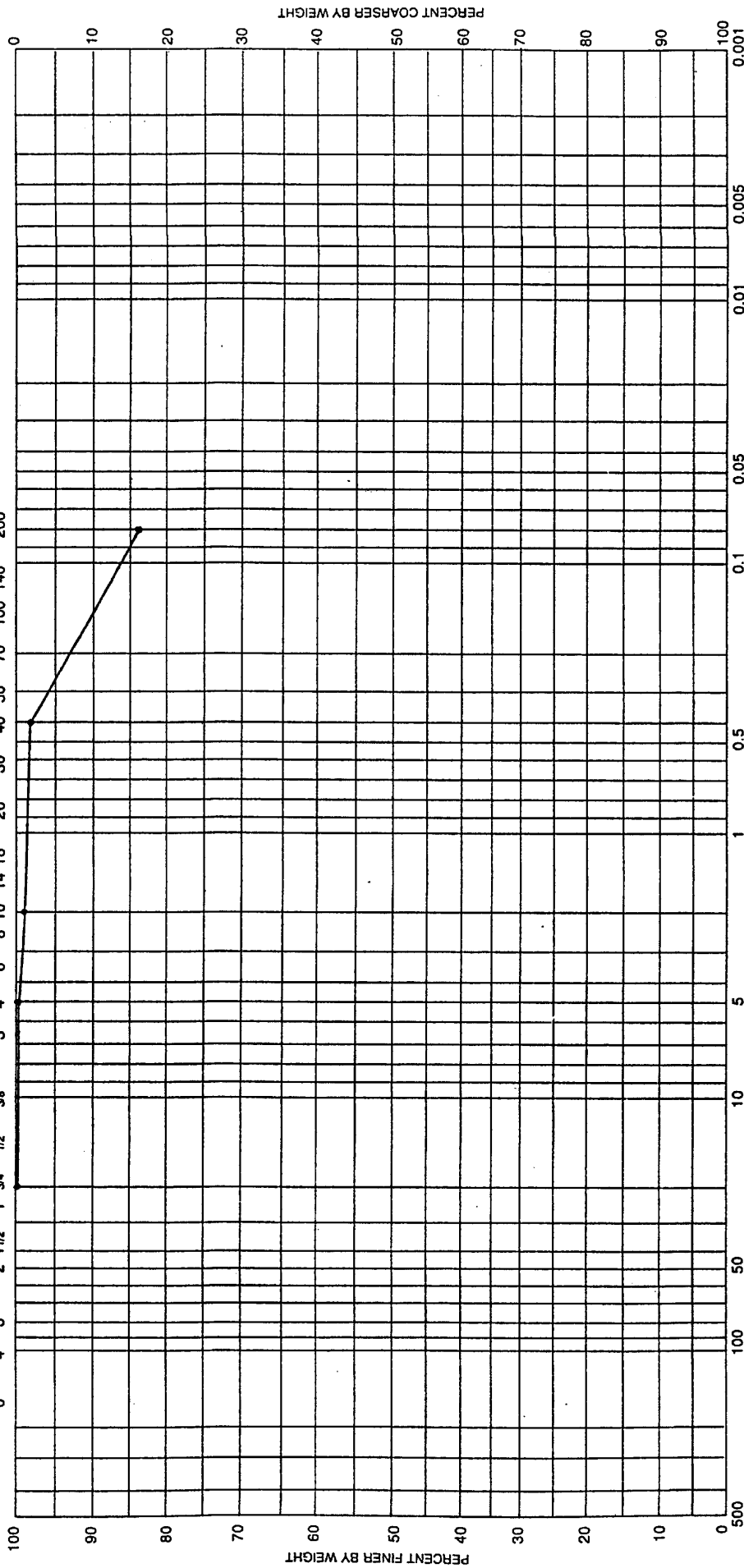
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
TB-1-6	30'	Sandy Clay: Reddish Tan w/Scattered Calcareous Nodules (10%) Stiff, Dry (CL)		30	13	17
Project Amarillo MSWLF						
Area						
Boring No. TB-1						
Date 7-5-94						

GRADATION CURVES

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



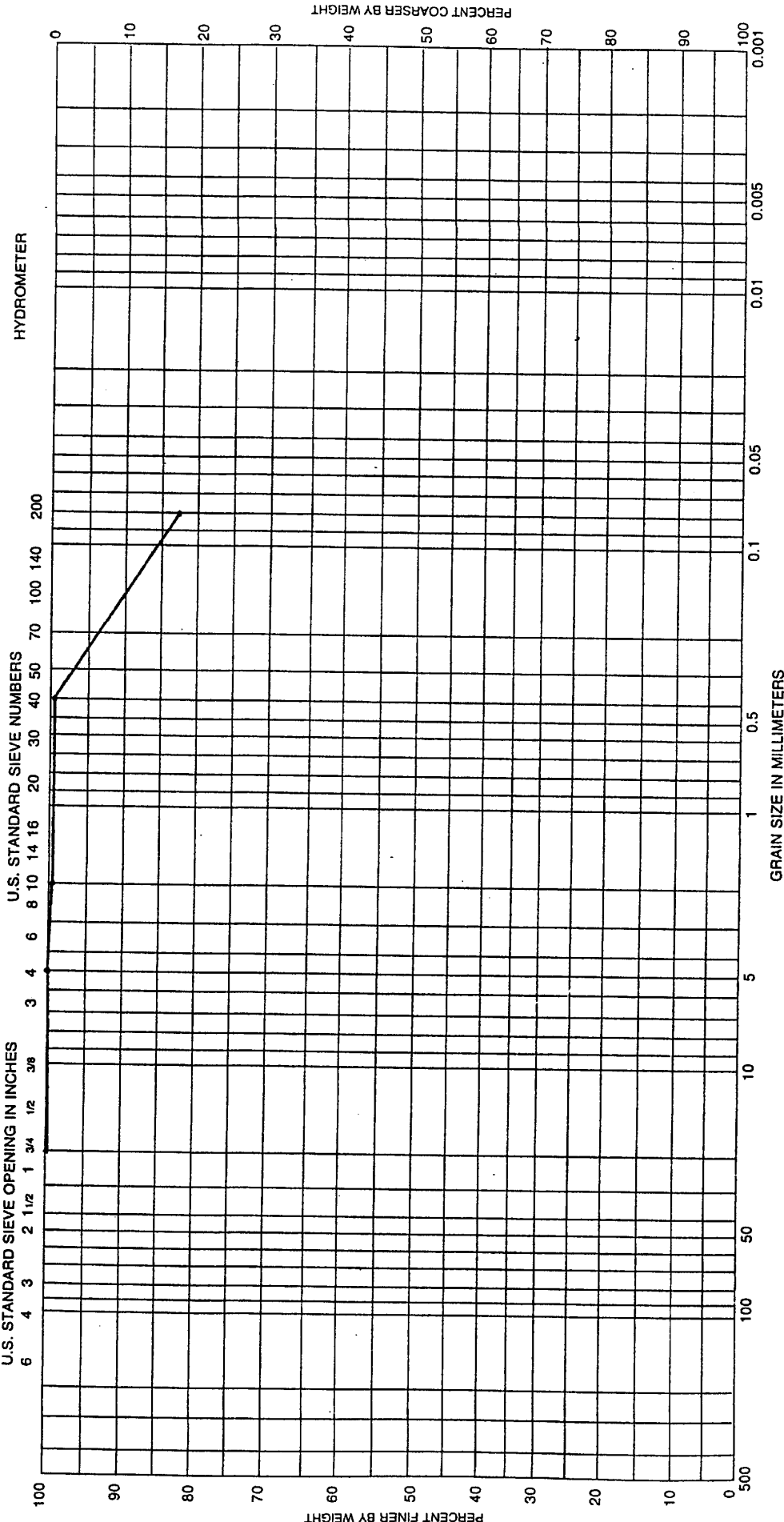
SILT OR CLAY

SAND

GRAVEL

Sample No. TB-1-7	Elev or Depth 35'	Classification				PI
		Sandy Clay: Reddish Tan w/Scattered Calcareous Nodules (10%) Stiff, Dry (CL)	Net w %	LL	PL	
			35	20	15	
						Area
						Boring No. TB-1
						Date 7-5-94
GRADATION CURVES						





Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
TB-1-8	40'	Sandy Clay: Reddish Tan w/Scattered Calcareous Nodules (10%) Stiff-Dry (CL)		32	21	11
GRADATION CURVES						

COBBLES	GRAVEL		SAND		SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE	

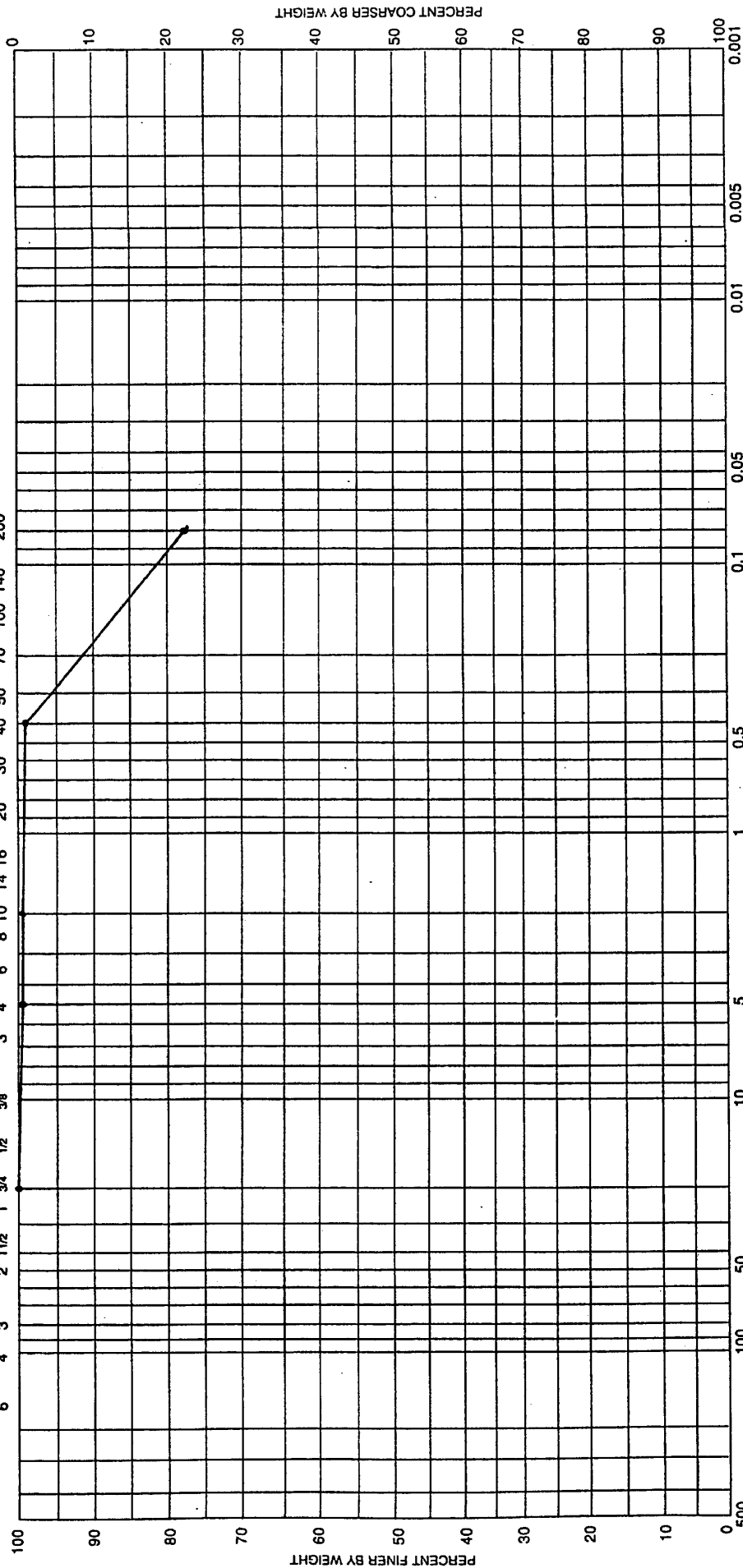
  

Project	Amarillo MSWLF
Area	
Boring No.	TB-1
Date	7-5-94

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



Sample No.	Elev or Depth	Classification	Net w %			PI
			LL	PL	PI	
TB-1-9	45'	Sandy Clay: Reddish Tan w/Scattered Calcareous Nodules (10%) Stiff, Dry (CL)	32	22	10	

GRADATION CURVES

SILT OR CLAY

Project Amarillo MSWLF

Area

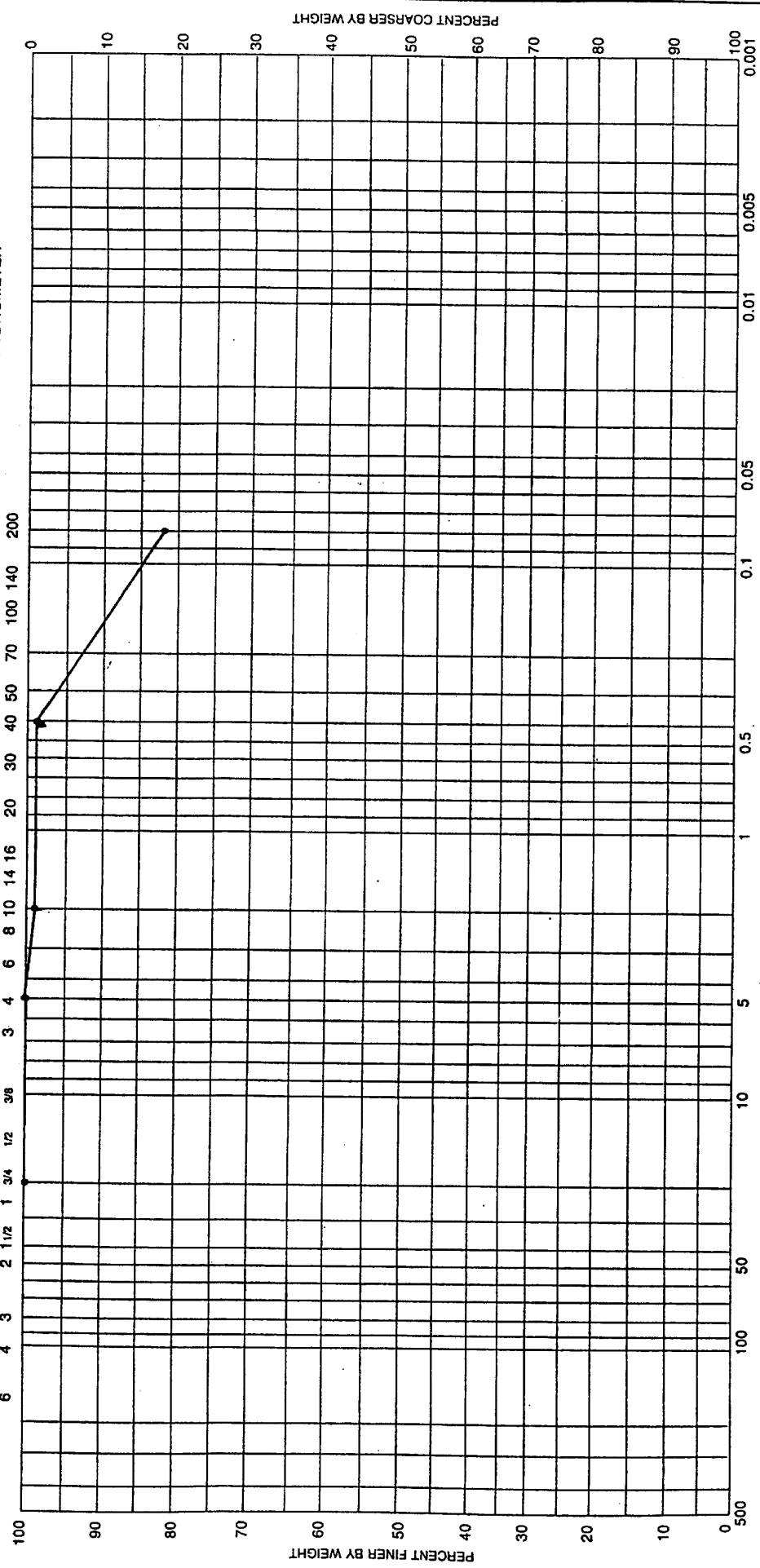
Boring No. TB-1

Date 7-5-94

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



GRAIN SIZE IN MILLIMETERS

COBBLES	GRAVEL		SAND		SILT OR CLAY	
	COARSE	FINE	COARSE	NEUTRAL	FINE	

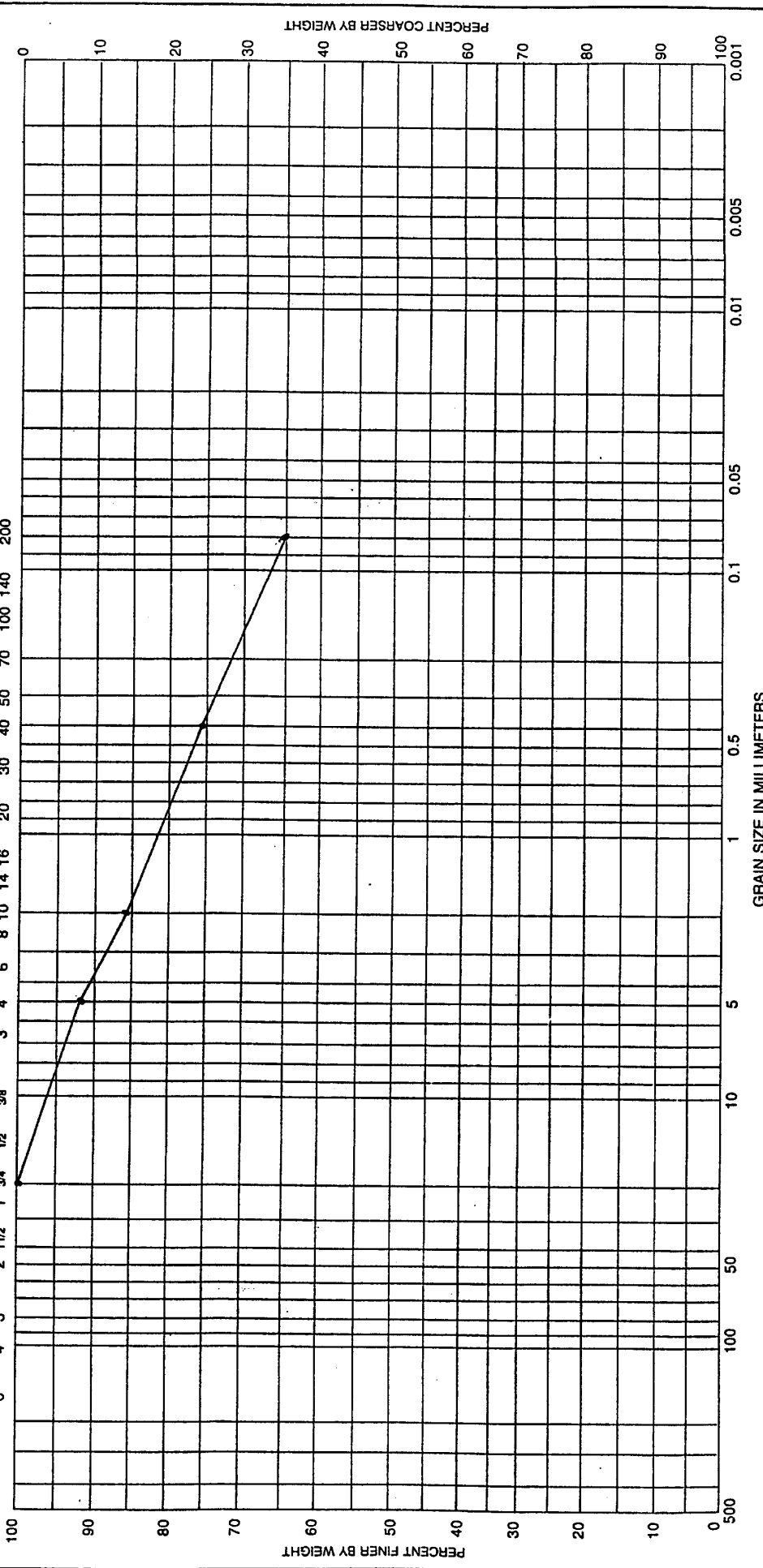
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
TB-1-10	50'	Sandy Clay: Reddish Tan w/Scattered Calcareous Nodules (10%) Stiff, Dry (CL)		33	26	7	Amarillo MSWLF
							Area
							Boring No. TB-1
							Date 7-5-94

GRADATION CURVES

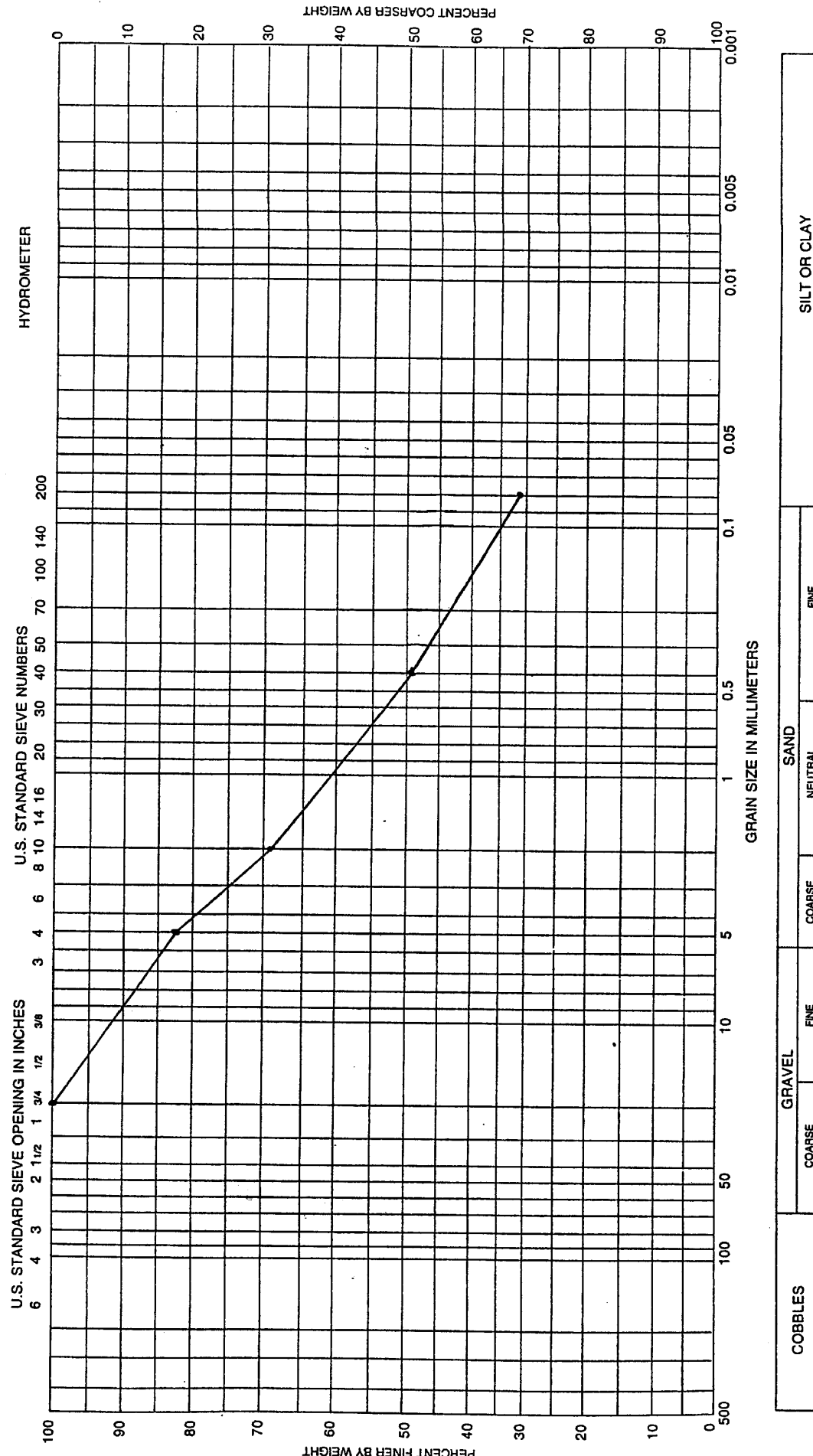
U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



Sample No.	Elev or Depth	Classification	SAND		LL	PL	PI	Project
			COARSE	NEUTRAL				
TB-1 -11	55'	Sandy Clay: Reddish Tan with Scattered Calcareous Nodules (10%) Stiff, Dry (CL)			26	19	7	Amarillo MSWLF
								Area
								Boring No. TB-1
<b>GRADATION CURVES</b>								Date 7-5-94



Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
TB-1 - 12	60'	Sandy Clay: Reddish Tan with Scattered Calcareous Nodules (10%) Stiff, Dry (CL)	21	18	3	

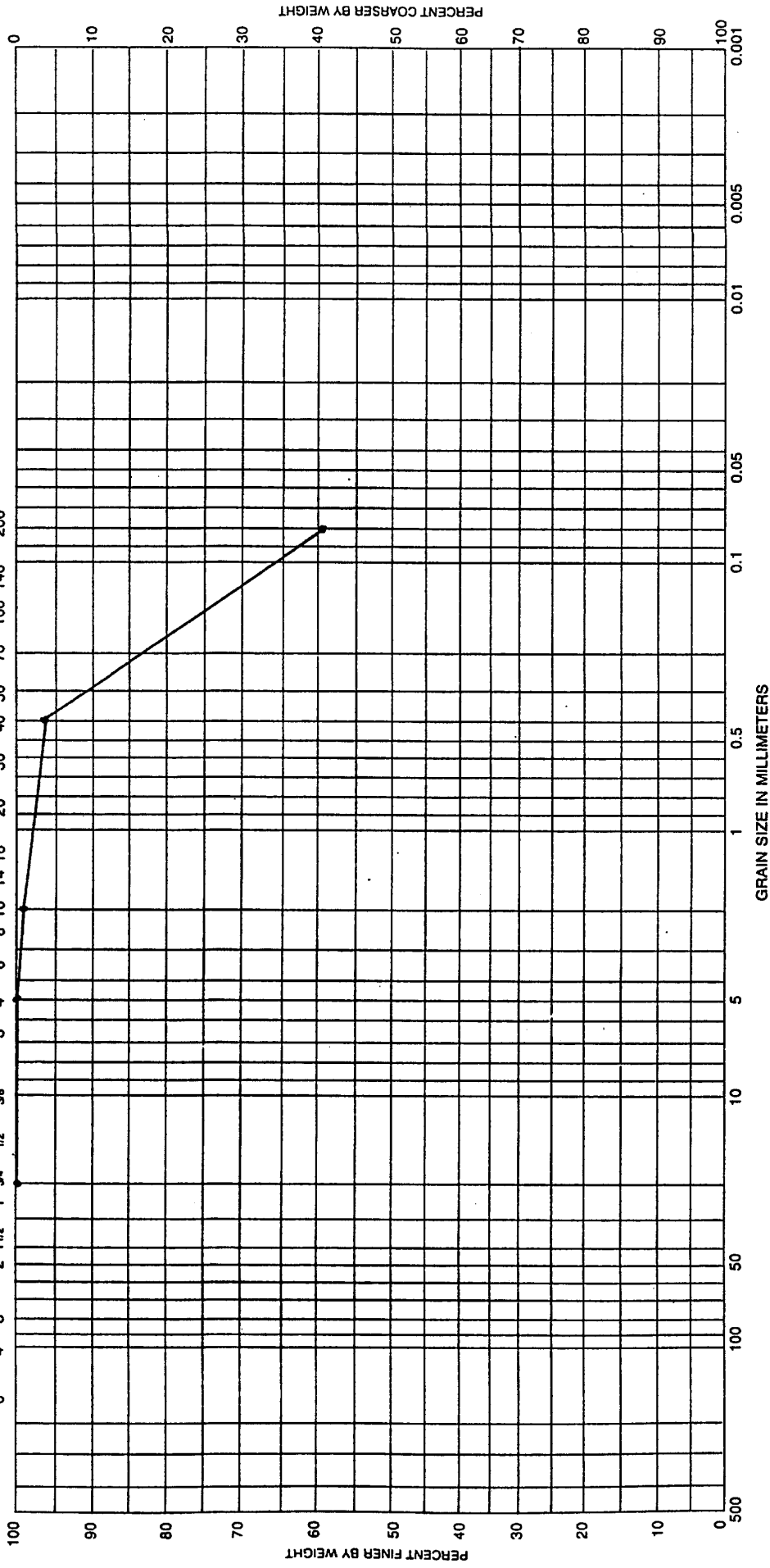
Project	Amarillo MSWLF
Area	
Boring No.	TB-1
Date	7-5-94

GRADATION CURVES

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

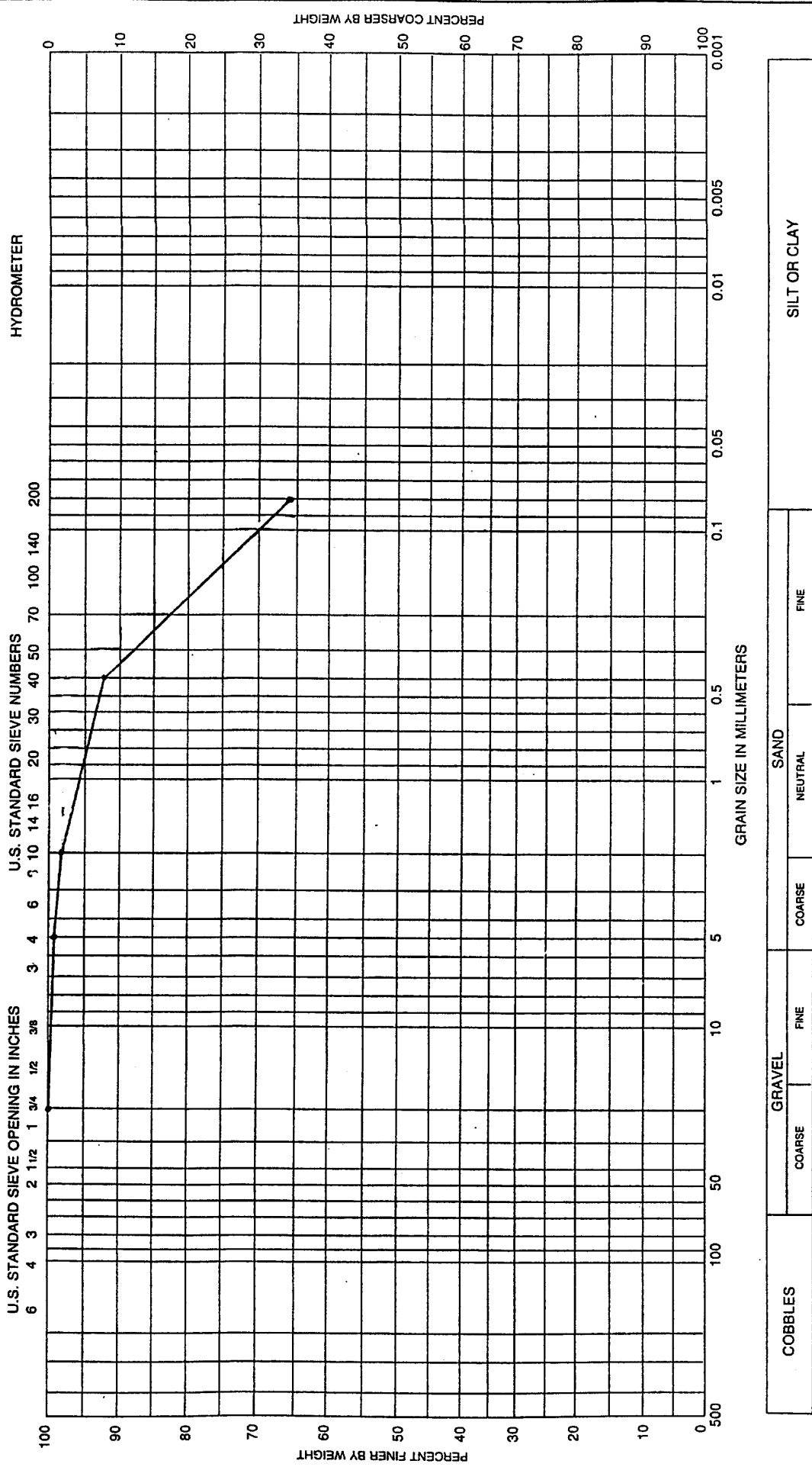


PERCENT COARSER BY WEIGHT

COBBLES		GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	COARSE	NEUTRAL	FINE			

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
TB-1-13	65'	Sandy Clay: Reddish Tan w/Scattered Calcareous Nodules (10%) Stiff, Dry (CL)		21	16	5	Amarillo MSWLF
							Area
							Boring No. TB-1
							Date 7-5-94

GRADATION CURVES



Sample No.	Elev or Depth	Classification				SAND			PI	
		COARSE	FINE	GRAVEL	COARSE	NEUTRAL	FINE	LL		PL
TB-1-14	70'	Caliche: Light Tan, Limestone Layers, Fractures, Hard (CL)				Net w %	23	18	5	5

GRADATION CURVES

Date 7-5-94

Boring No. TB-1

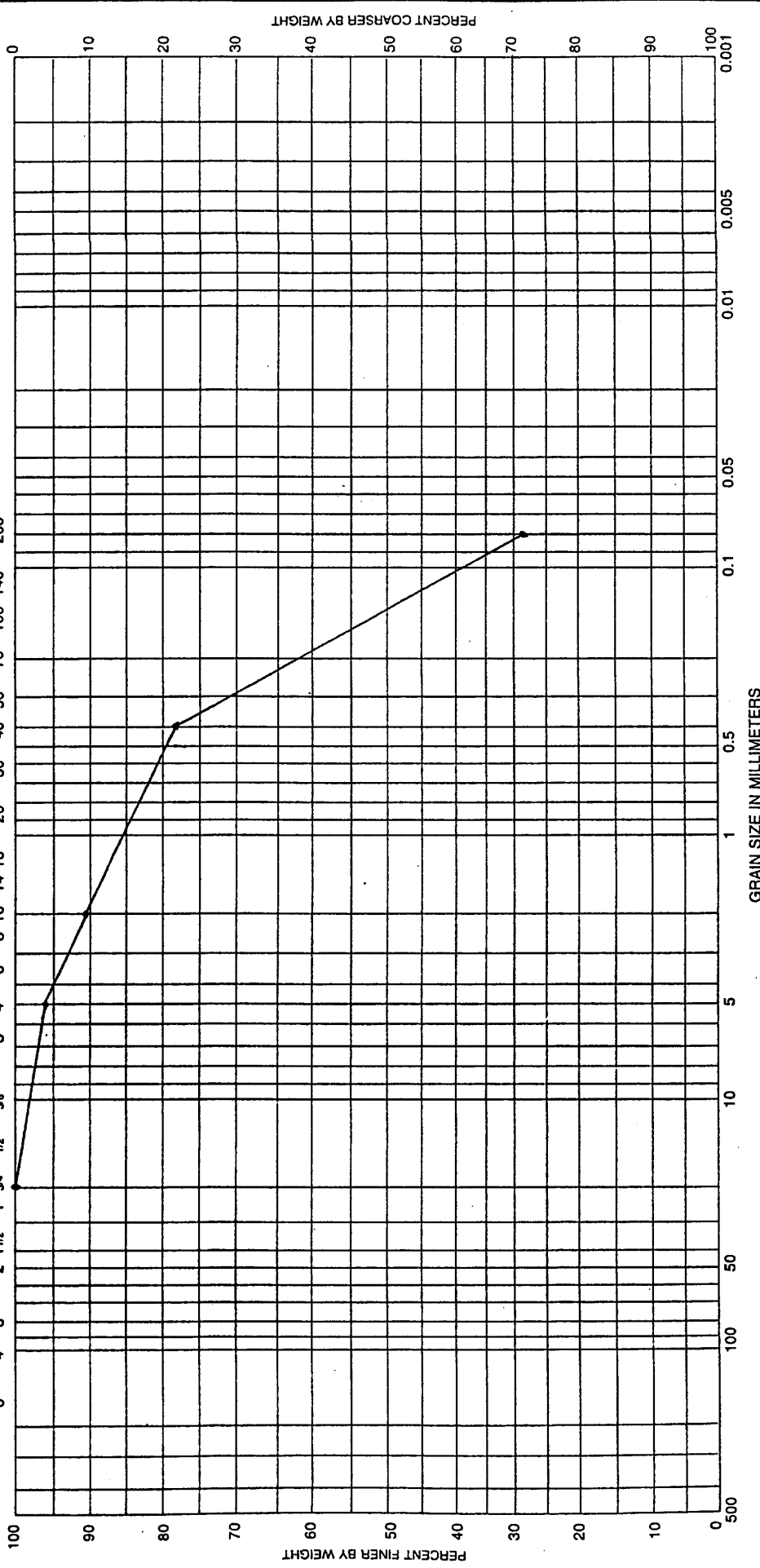
Area

Project Amarillo MSWLF

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



COBBLES		GRAVEL		SAND			SILT OR CLAY	
COARSE	FINE	COARSE	NEUTRAL	FINE				

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
TB-1 - 17	85'	Clayey Sand; Reddish Tan to Tan with Scattered Calcareous Nodules (10%) DRY (SC)		21	18	3
Project			Amarillo MSWLF			
Area						
Boring No.			TB-1			
Date			7-5-94			
GRADATION CURVES						

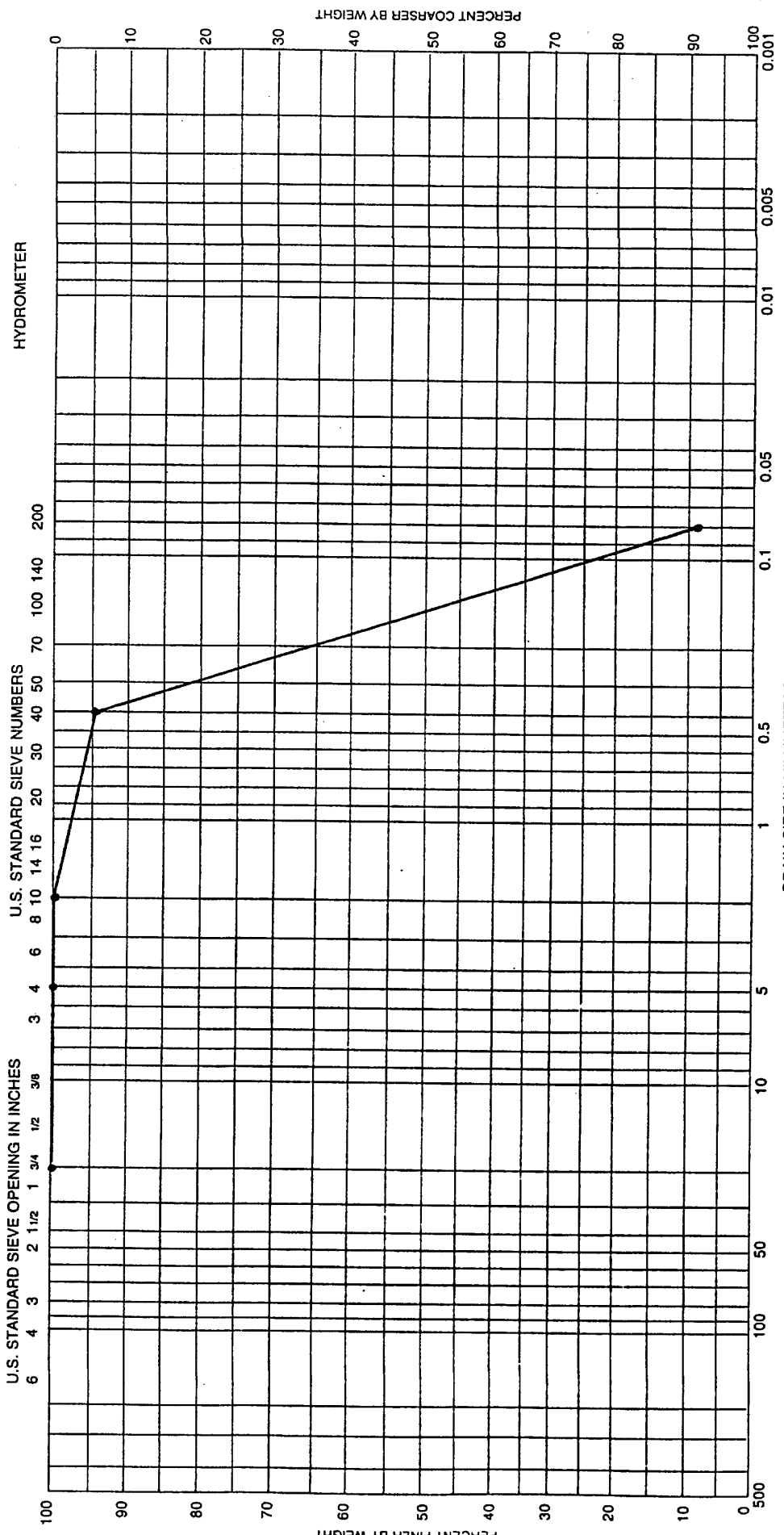






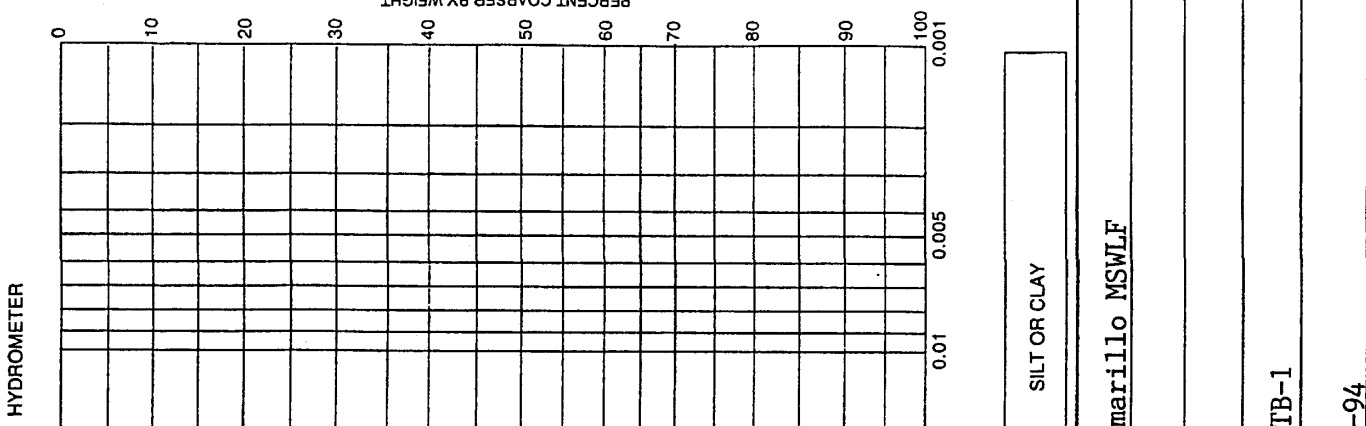






COBBLES		GRAVEL		SAND		SILT OR CLAY	
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
TB-1 - 22	110'	Clayey Sand: Reddish Tan to Tan, With Scattered Calcareous Nodules (10%) Dry (SC)		14	11	3	Amarillo MSW-LF
							Area
							Boring No. TB-1
							Date 7-5-94

GRADATION CURVES



U.S. STANDARD SIEVE OPENING IN INCHES	U.S. STANDARD SIEVE NUMBERS	HYDROMETER
6	10	
4	20	
3	30	
2	40	
1 1/2	60	
1	100	
3/4	200	
1/2	400	
3/8	600	
3/16	1000	
1/8	2000	
1/16	3000	
1/32	6000	
1/64	12000	
1/128	24000	
1/256	48000	
1/512	96000	
1/1024	192000	

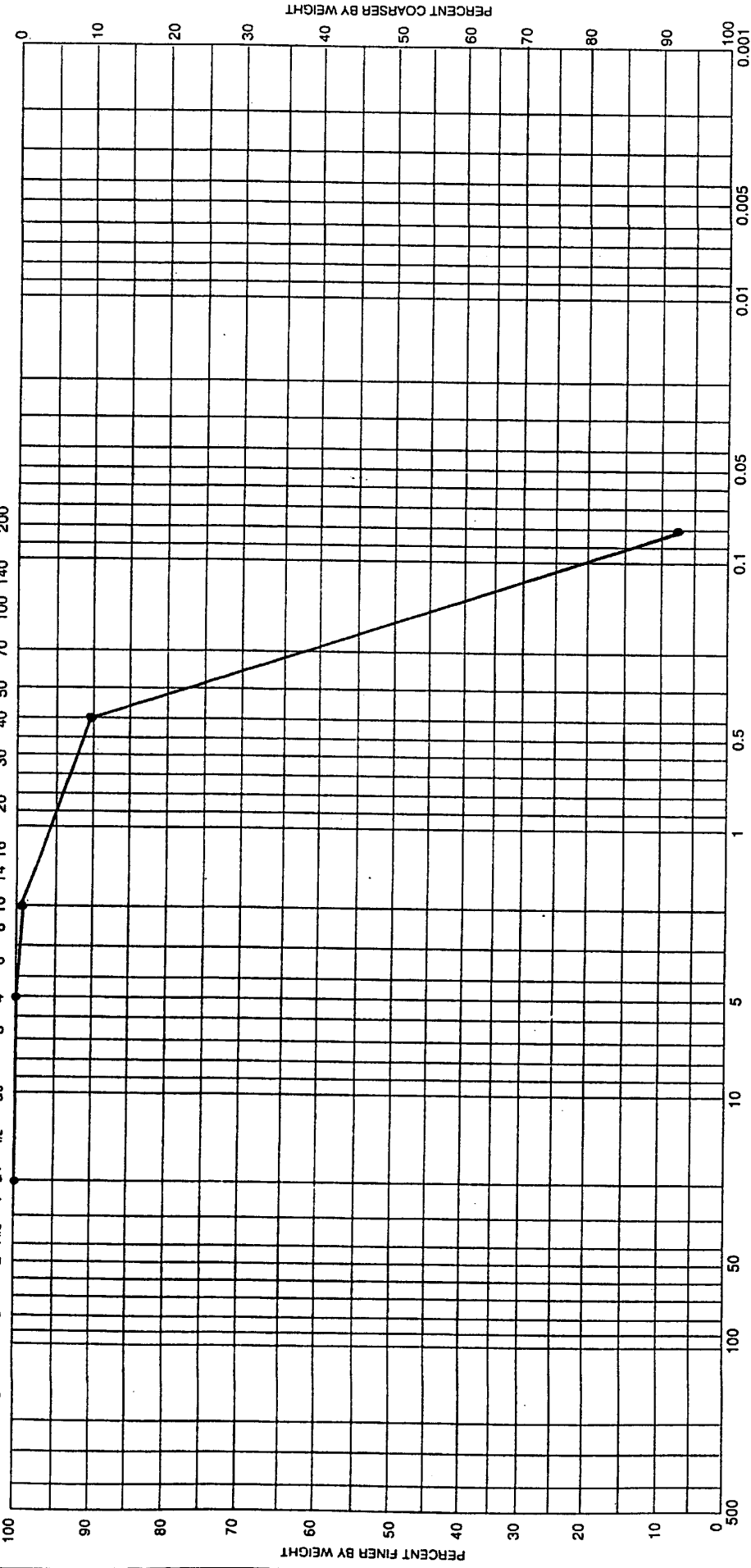
Sample No.	Elev or Depth	Classification			SOIL CLASSIFICATION		
		COARSE	FINE	Classification	COARSE	FINE	SILT OR CLAY
7B-1 - 23	115'	Clayey Sand; Reddish Tan to Tan with Scattered Calcareous Nodules (10%) Dry (SC)			Project Amarillo MSWLF		
					Area		
					Boring No. TB-1		
					Date 7-5-94		

GRADATION CURVES

U.S. STANDARD SIEVE OPENING IN INCHES  
6 4 3 2 1 1/2 1 3/4 1/2 3/8

U.S. STANDARD SIEVE NUMBERS  
10 20 30 40 50 60 70 100 140 200

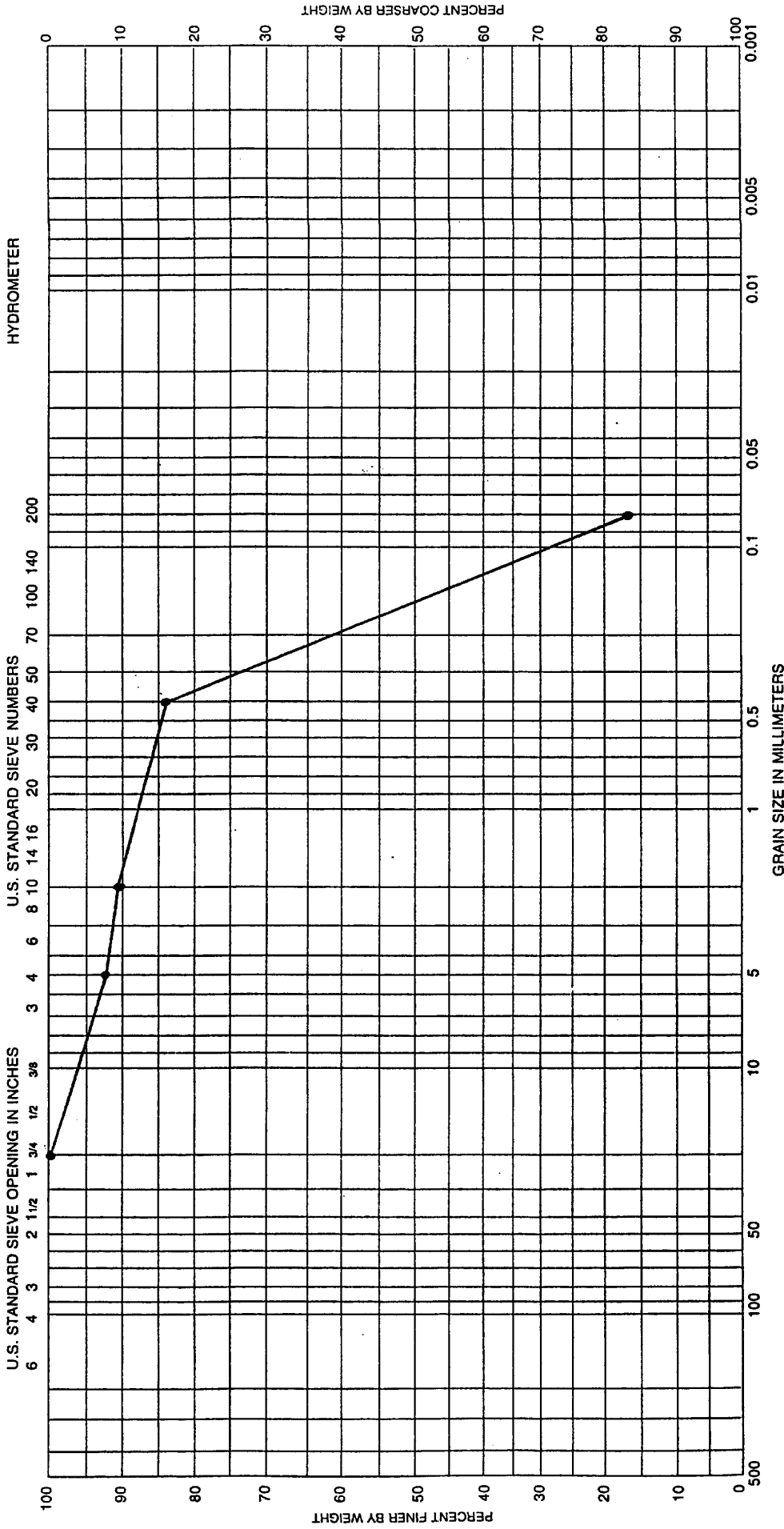
HYDROMETER



GRAIN SIZE IN MILLIMETERS

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
TB-1 - 24	120'	Clayey Sand; Reddish Tan to Tan, With Scattered Calcareous Nodules (10%) Dry (SC)		16	13	3	Amarillo MSW-LF
							Area
							Boring No.
							TB-1
							Date
							7-5-94
GRADATION CURVES							



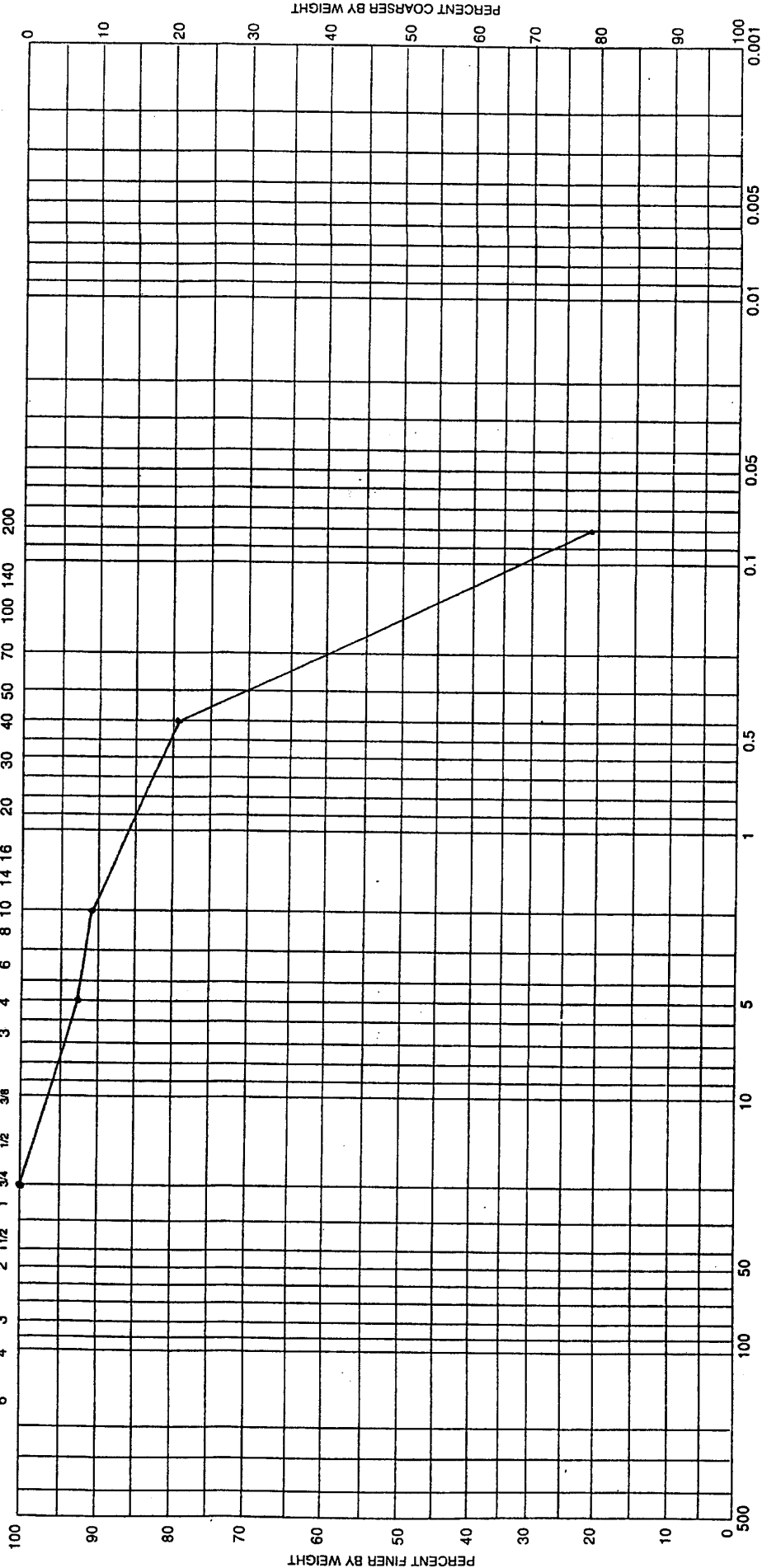
Sample No.	Elev or Depth	Classification	SOIL				Project
			COARSE	FINE	NEUTRAL	FINE	
TB-1 - 25	125'	Clayey Sand: Reddish Tan to Tan, with Scattered Calcareous Nodules (10%) (SC)					Amarillo MSW-LF
							Area
							Boring No.
							Date
GRADATION CURVES							



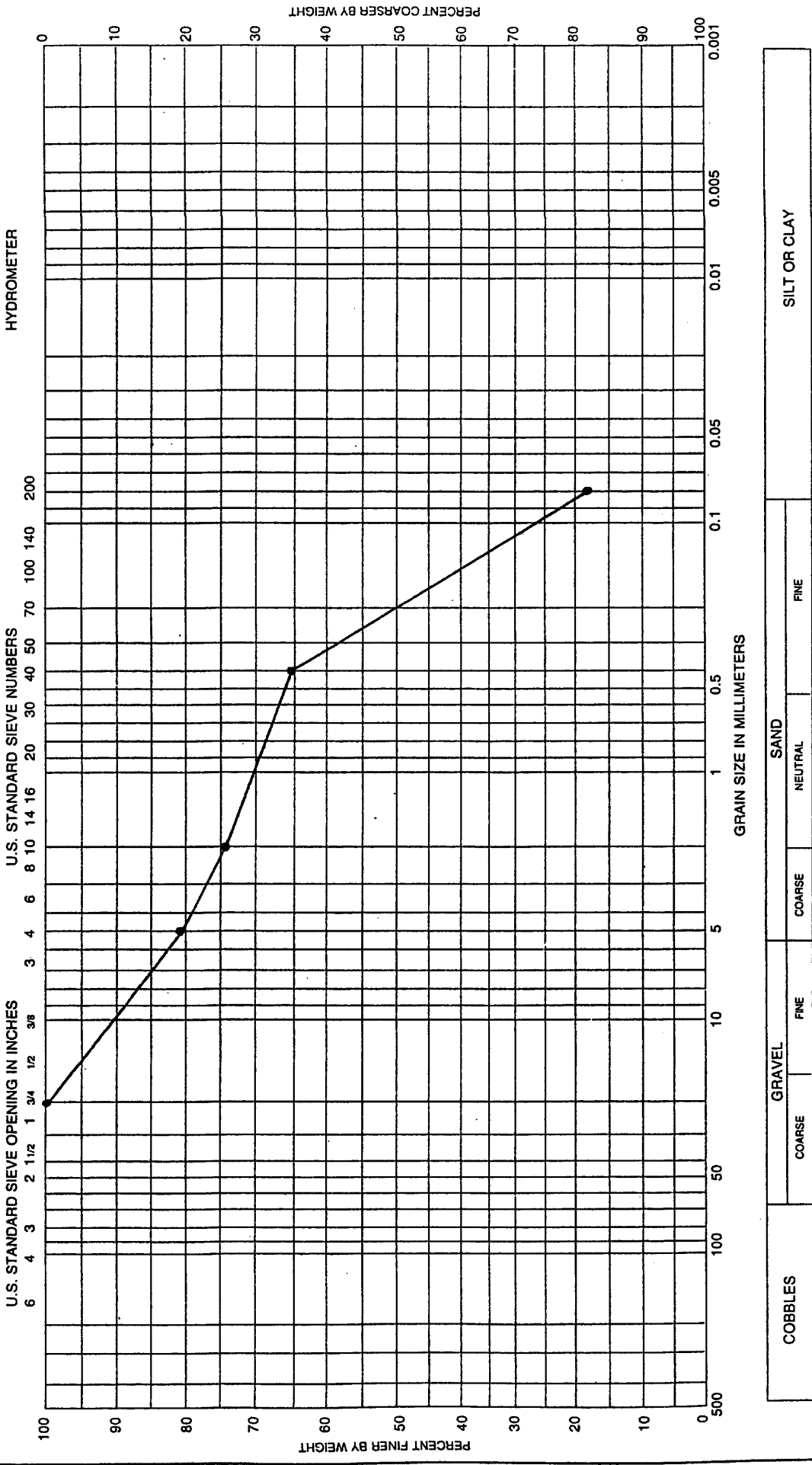
HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



COBBLES		GRAVEL		SAND		SILT OR CLAY		
		COARSE	FINE	NEUTRAL	NET W %	LL	PL	
Sample No.	Elev or Depth	Classification				PI		
TB-1 - 27	135'	Clayey Sand; Reddish Tan to Tan, with Scattered Calcareous Nodules (10%) (SC)				15	11	4
		Project				Amarillo MSWLF		
		Area						
		Boring No.				TB-1		
		Date				7-5-94		
GRADATION CURVES								

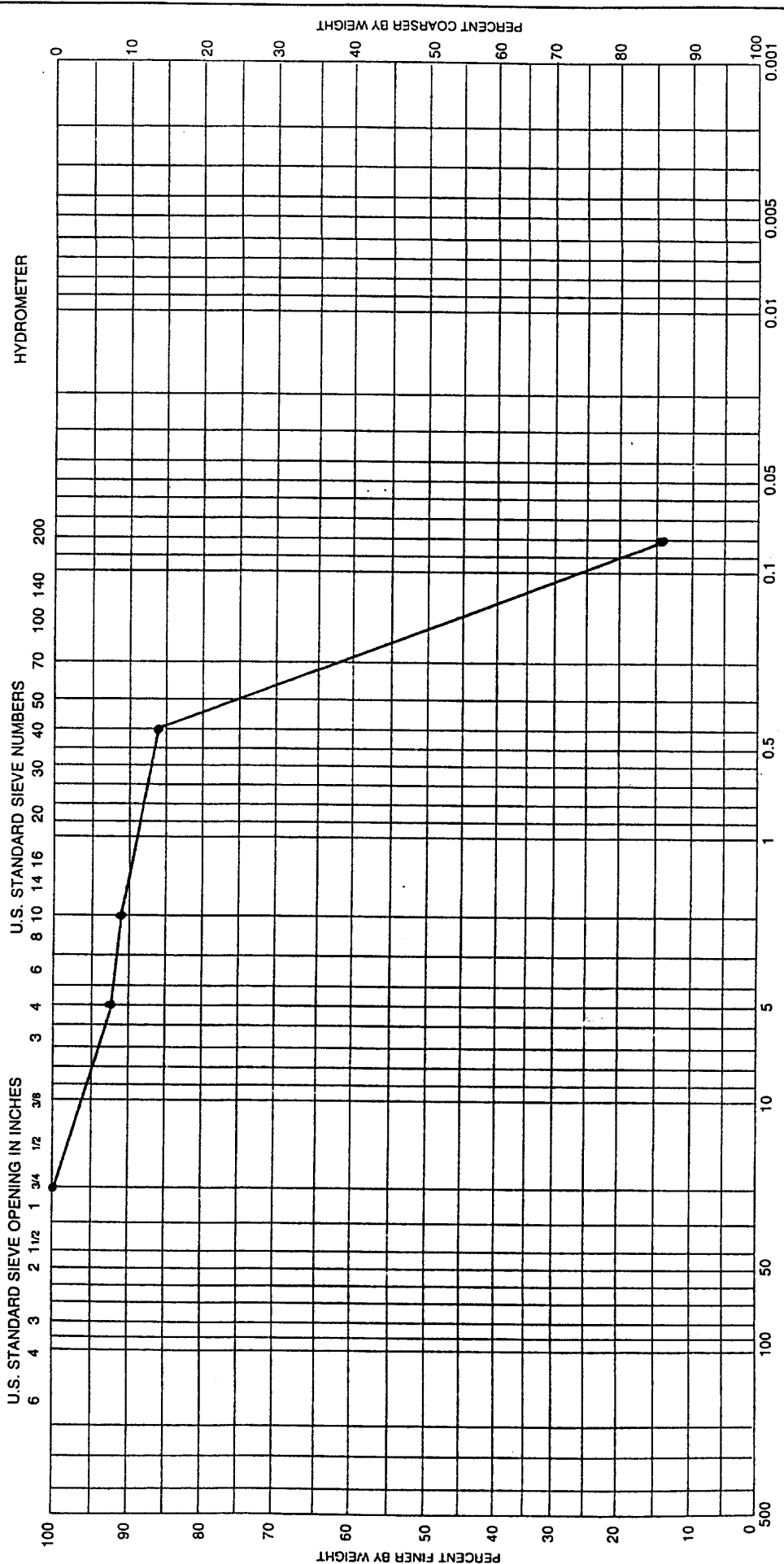


Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
TB-1 - 29	145'	Clayey Sand: Reddish Tan to Tan, With Scattered Calcareous Nodules (10%) (SC)				NP

COBBLES		GRAVEL		SAND			SILT OR CLAY
		COARSE	FINE	NEUTRAL	FINE		
		Amarillo MSW-LF					
Project		Area					
Boring No.		TB-1					
Date		7-5-94					

**GRADATION CURVES**

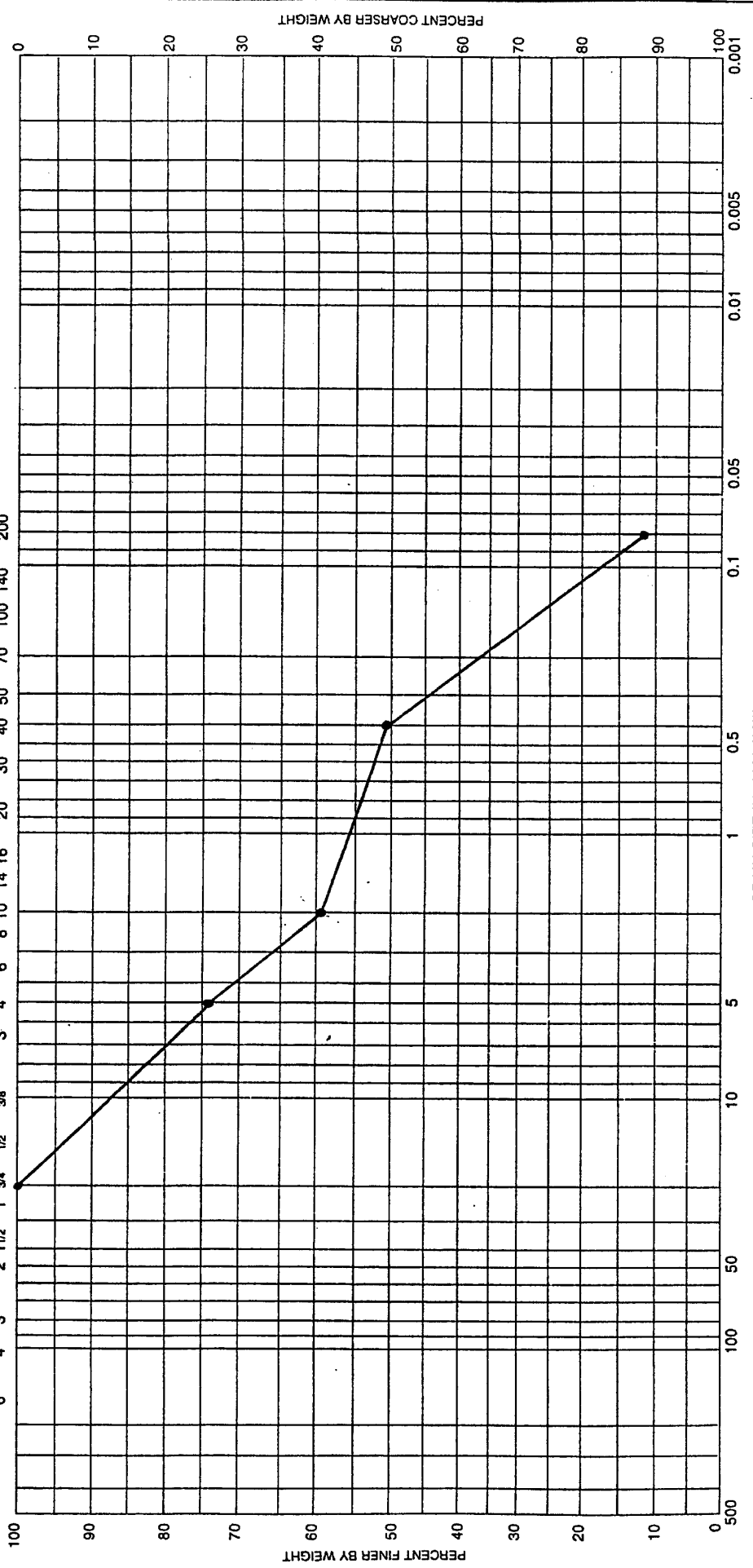


COBBLES		GRAVEL		SAND			SILT OR CLAY			
		COARSE	FINE	NEUTRAL	FINE	PI				
Sample No.	Elev or Depth	Classification					PL	Project		
TB-1 - 31	155'	Clayey Sand: Reddish Tan to Tan, With Scattered Calcareous Nodules (10%) (SC)					16	Amarillo MSW-LF		
		Net w %					21	Area		
								Boring No. TB-1		
								Date 7-5-94		
GRADATION CURVES										

HYDROMETER

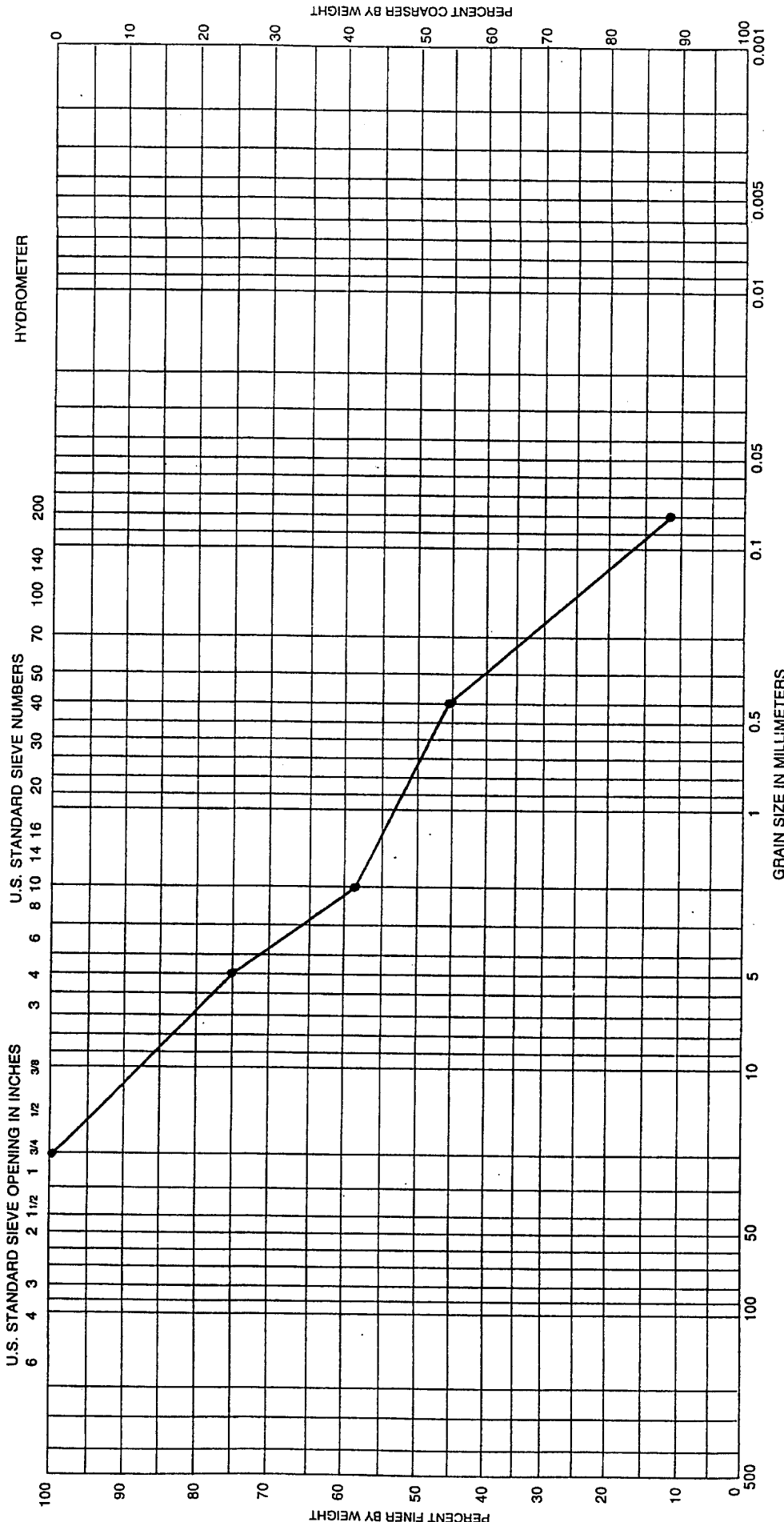
U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



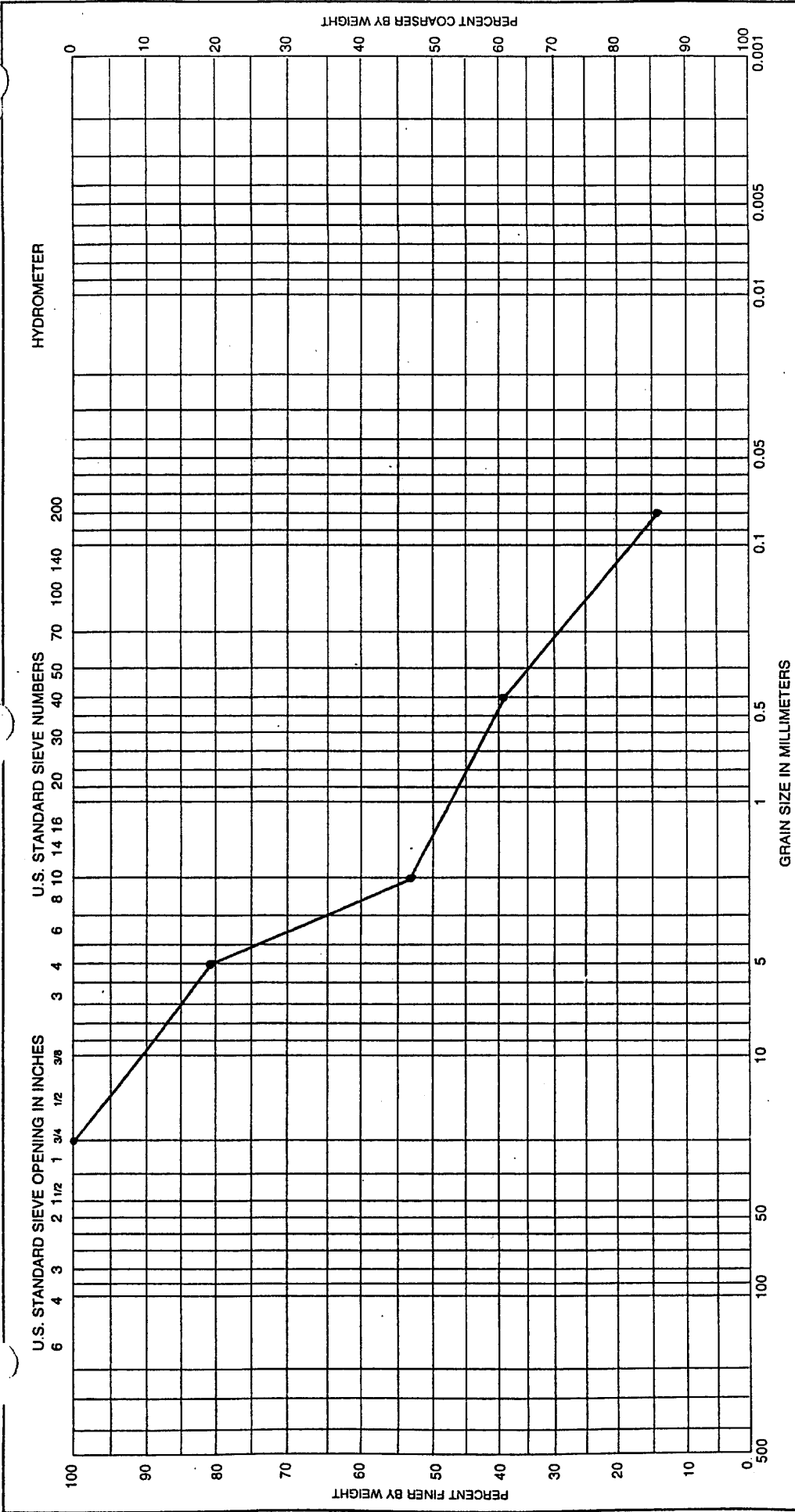
Sample No.	Elev or Depth	Classification				SAND			SILT OR CLAY		
		COARSE	FINE	COARSE	FINE	NETRAL	Net w %	LL	PL	PI	Project
TB-1 - 33	165'	Clayey Sand: Reddish Tan to Tan, With Scattered Calcareous Nodules (10%) (SC)						19	16	3	Amarillo MSW-LF
											Area
											Boring No.
											TB-1
											Date
											7-5-94

GRADATION CURVES



COBBLES		GRAVEL		SAND			SILT OR CLAY	
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project	Date
TB-1 - 35	175'	Clayey Sand: Reddish Tan to Tan, With Scattered Calcareous Nodules (10%) (SC)		18	14	4	Amarillo MSW-LF	
							Area	
							Boring No.	TB-1
							Date	7-5-94

GRADATION CURVES



HYDROMETER

U.S. STANDARD SIEVE OPENING IN INCHES: 6, 4, 3, 2 1/2, 1 3/4, 1 1/2, 3/8, 3, 4, 6, 8, 10, 14, 16, 20, 30, 40, 50, 70, 100, 140, 200

U.S. STANDARD SIEVE NUMBERS

PERCENT COARSER BY WEIGHT

GRAIN SIZE IN MILLIMETERS: 500, 250, 125, 75, 47.5, 25, 12.5, 7.5, 4.75, 2.5, 1.5, 0.75, 0.425, 0.25, 0.15, 0.075, 0.0425, 0.025, 0.015, 0.0075, 0.00425, 0.0025, 0.0015, 0.00075

COBBLES

GRAVEL: COARSE, FINE

SAND: NEUTRAL, FINE

SILT OR CLAY

Project: Amarillo MSW-LF

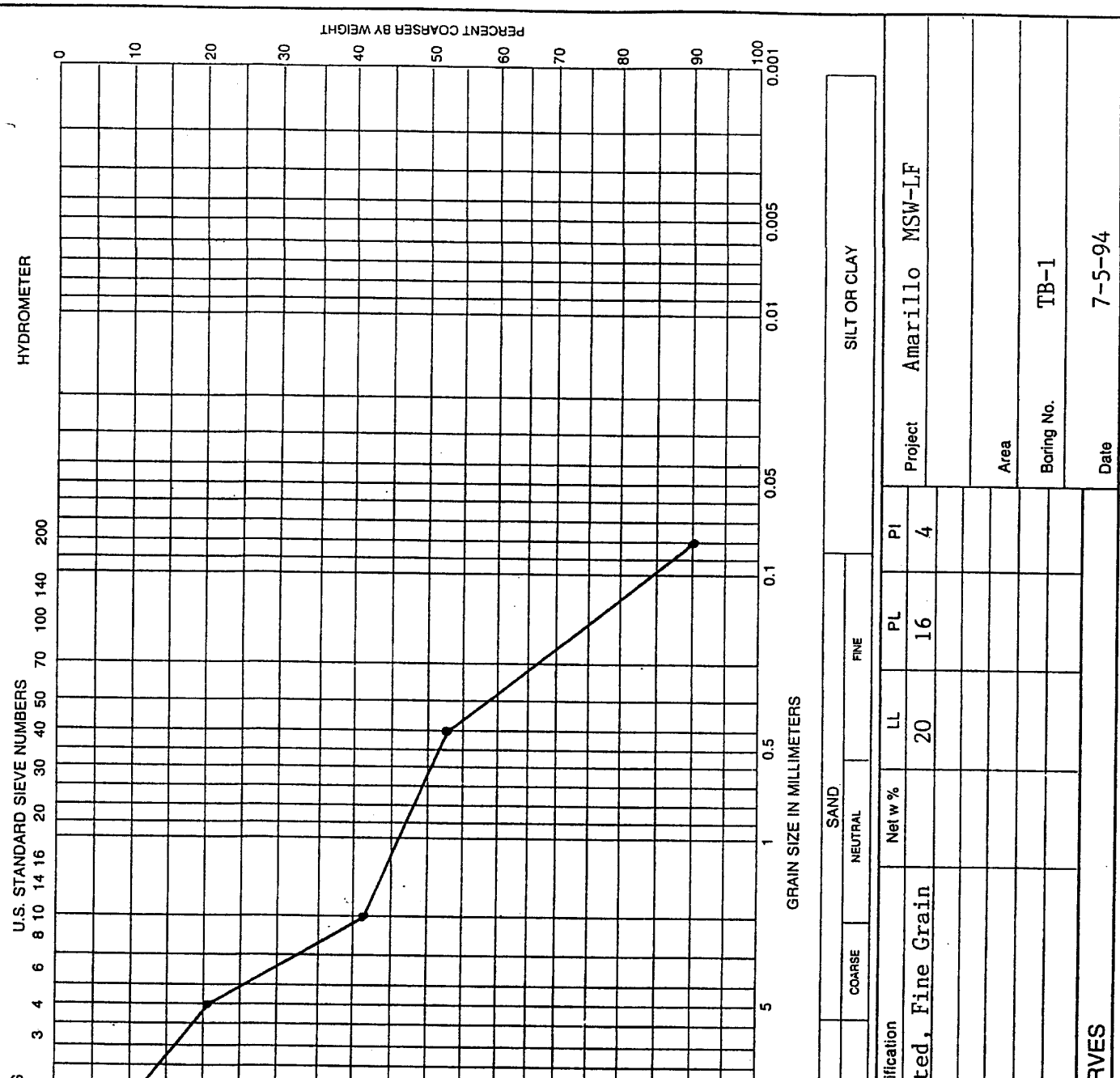
Area:

Boring No.: TB-1

Date: 7-5-94

Sample No.	Elev or Depth	Classification			Net w %	LL	PL	PI
		Sand	Silt	Clay				
TB-1 - 37	185'	Sand: Well Sorted, Fine Grain (SC)						NP

GRADATION CURVES

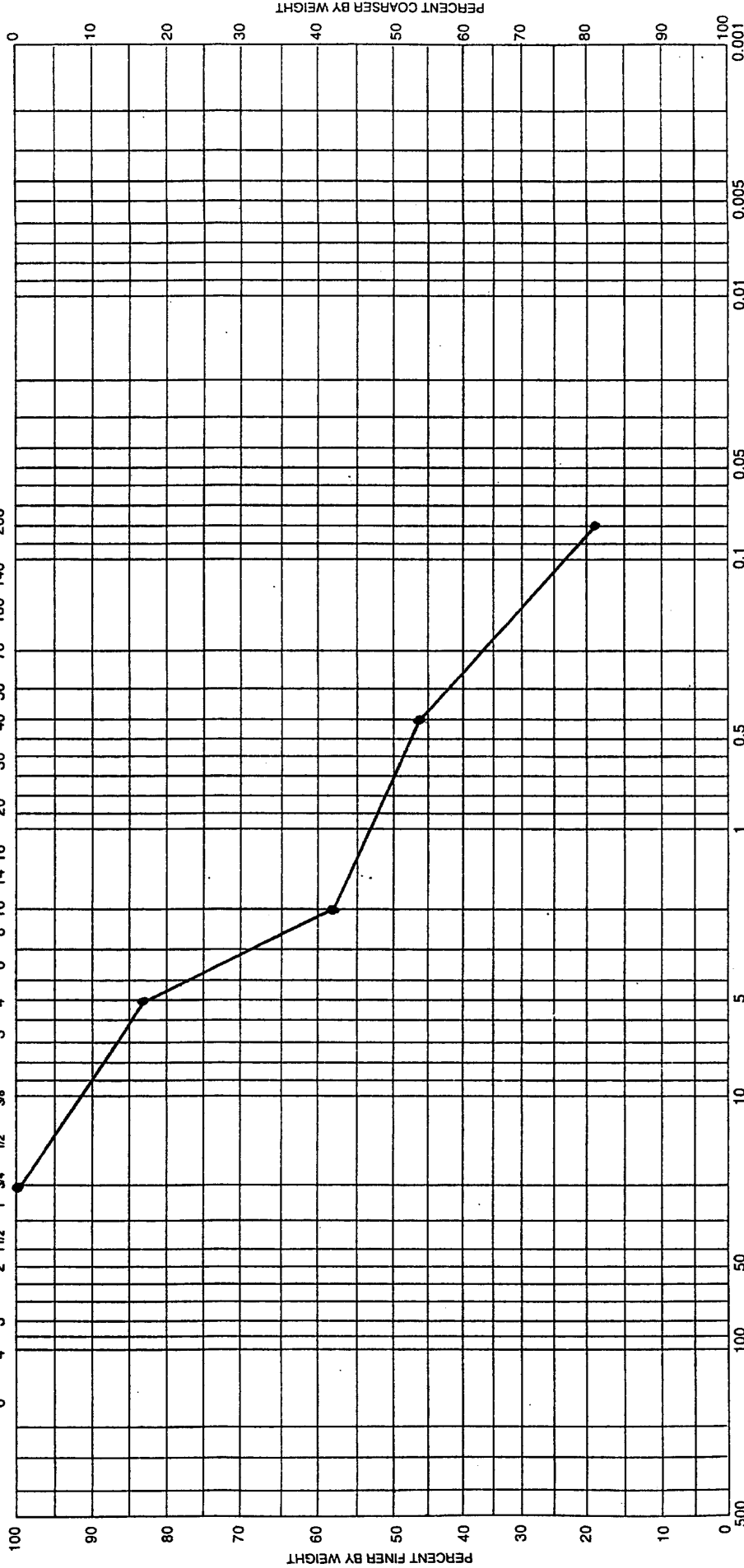


U.S. STANDARD SIEVE OPENING IN INCHES												U.S. STANDARD SIEVE NUMBERS												HYDROMETER											
COBBLES				GRAVEL				SAND				SILT OR CLAY																							
COARSE				FINE				COARSE				NEUTRAL				FINE																			
Sample No.		Elev or Depth		Classification												Net w %		LL		PL		PI		Project											
TB-1 - 39		195'		Sand: Well Sorted, Fine Grain (SC)														20		16		4		Amarillo MSW-LF											
																								Area											
																								Boring No. TB-1											
																								Date 7-5-94											
GRADATION CURVES																																			

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



Sample No.	Elev or Depth	Classification	GRAVEL			SAND			PI	PL	Project
			COARSE	FINE	COARSE	NEUTRAL	FINE				
TB-1 - 41	205'	Sand: Light Tan Fine Grain With Small Pea Gravel (15%) (SC)						20	16	Amarillo MSW-LF	
										Area	
										Boring No. TB-1	
										Date 7-5-94	

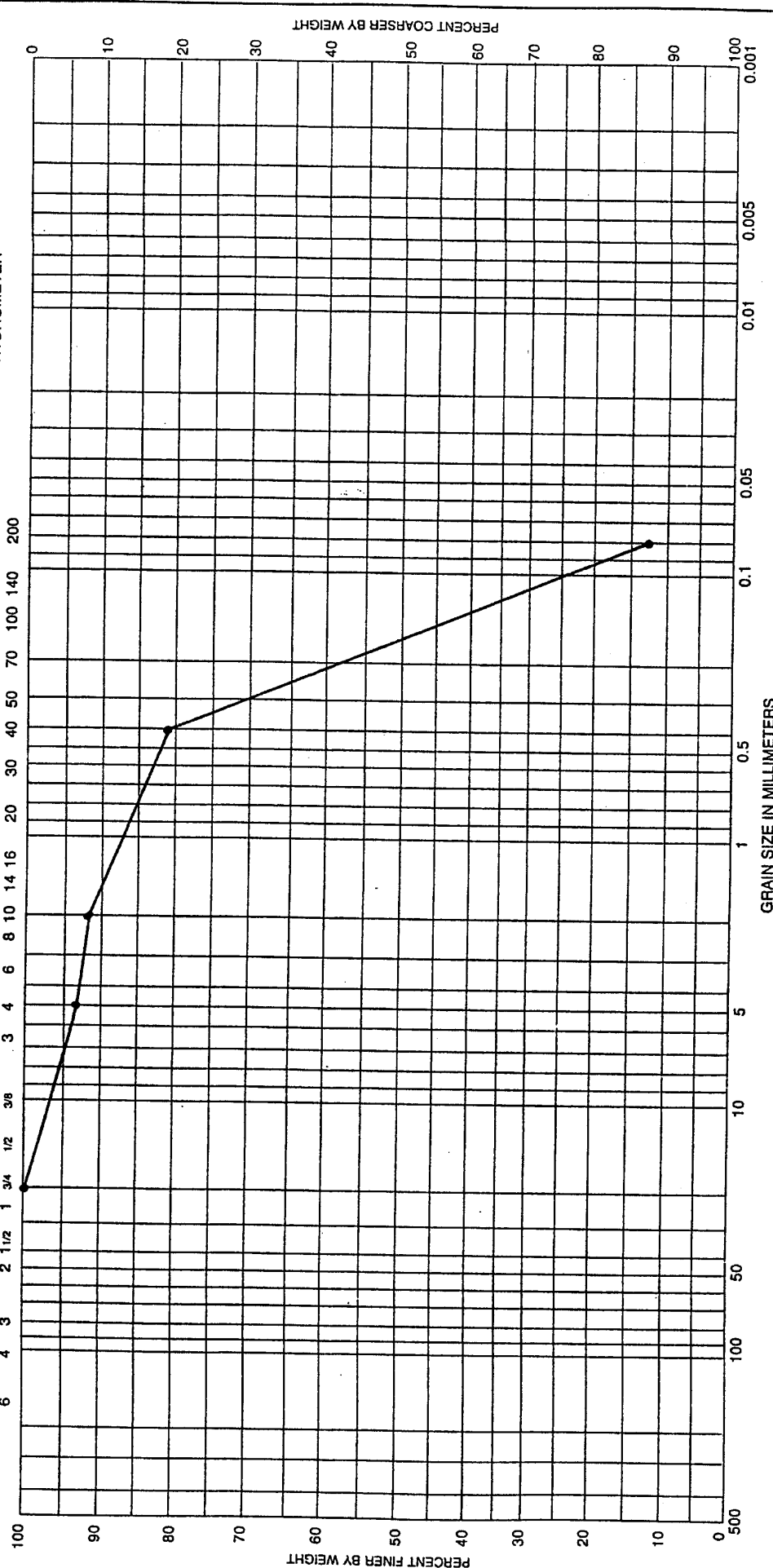
GRADATION CURVES



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



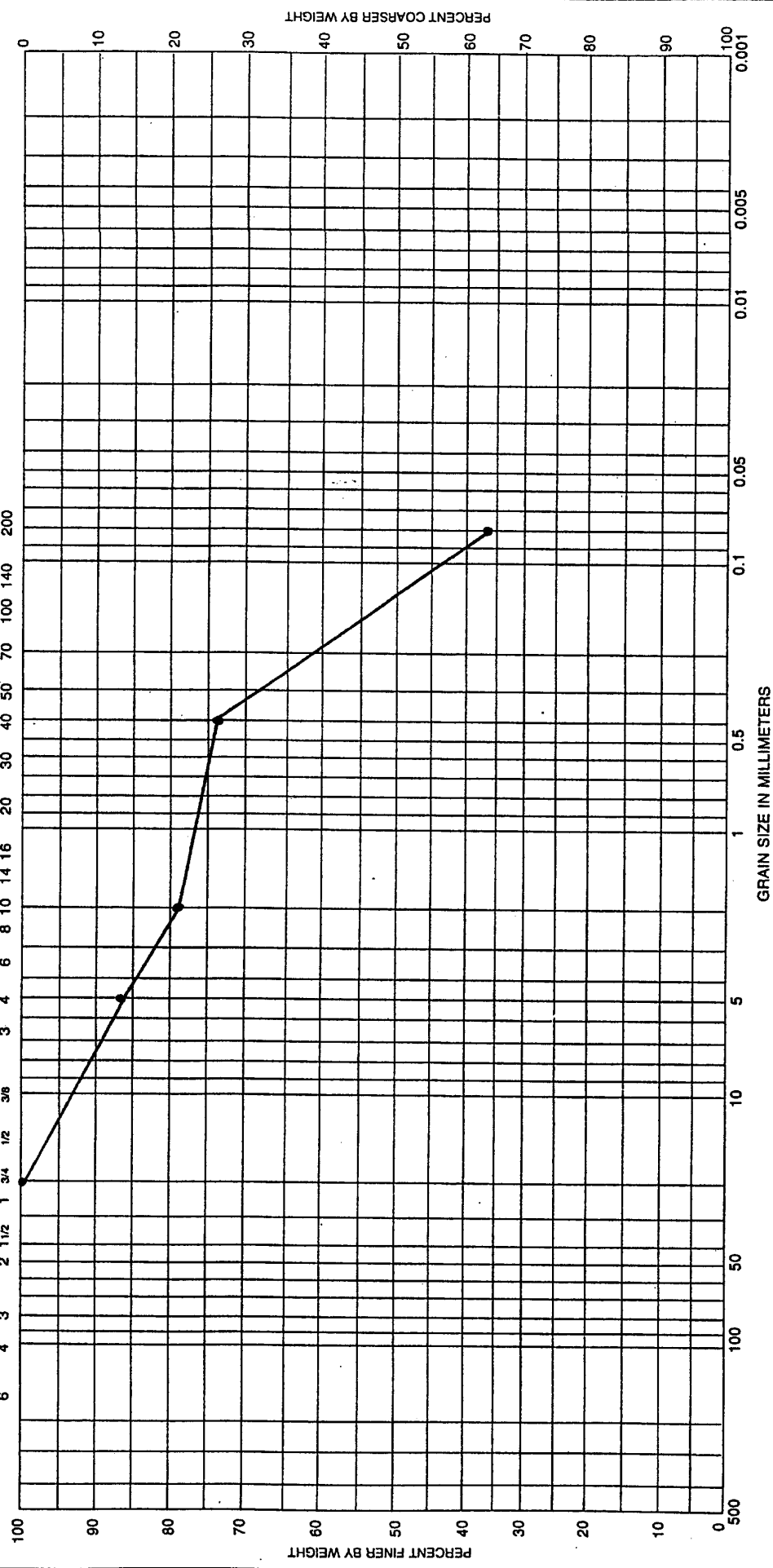
Sample No.	Elev or Depth	Classification				SOIL TYPE						
		COARSE	FINE	COARSE	FINE	NEUTRAL	NET w %	LL	PL	PI	Project	
TB-1 43	215'	Sand: Light Tan	Fine Grain With Small Pea	Gravel (15%) (SC)								Amarillo MSW-LF
												Area
												Boring No. TB-1
												Date 7-5-94

GRADATION CURVES

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	NETRAL	FINE		

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
TB-1 - 45	225'	Sand: Light Tan Fine Grain With Small Pea Gravel (15%) (SC)				NP

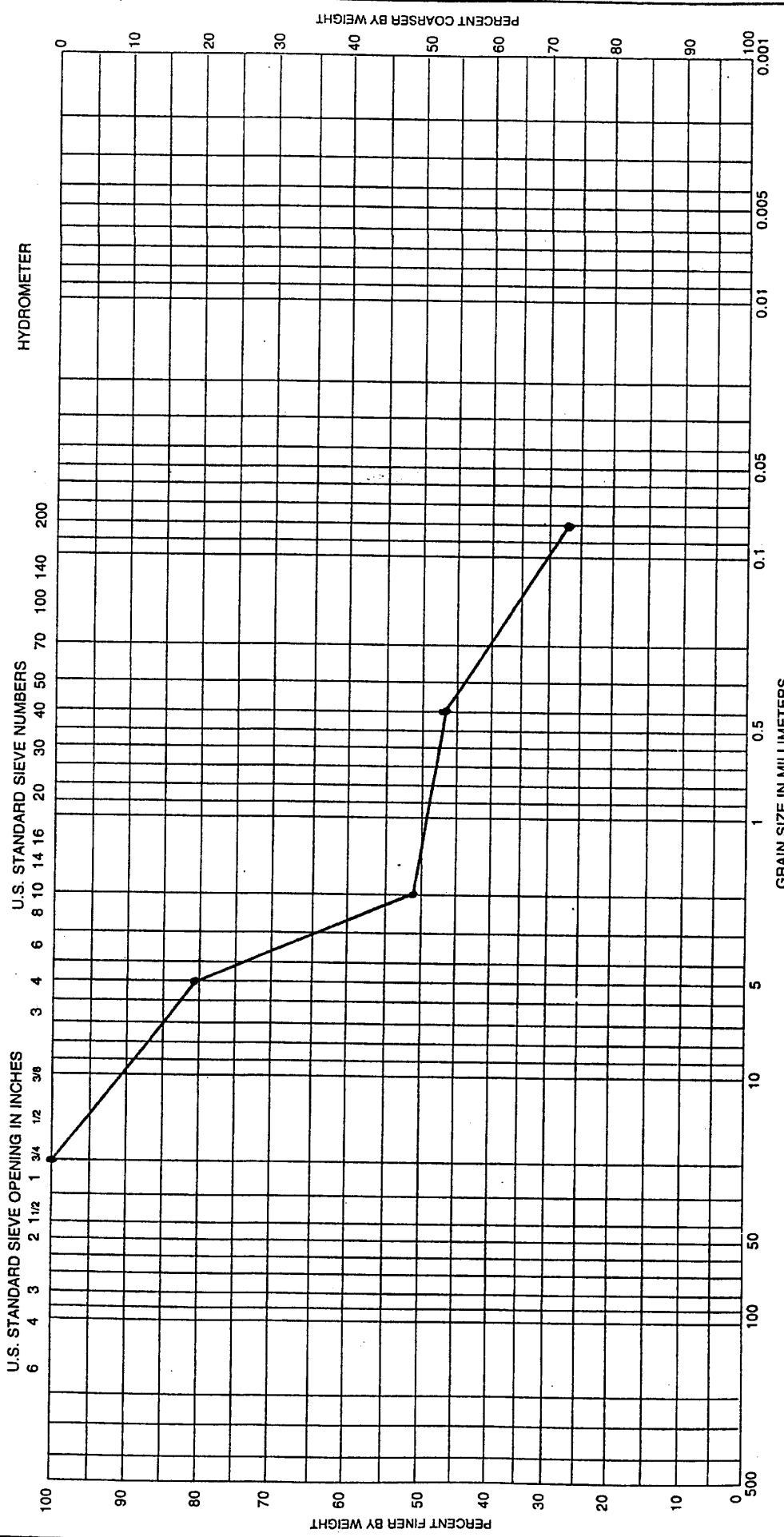
Project Amarillo MSW-LF

Area

Boring No. TB-1

Date 7-5-94

GRADATION CURVES

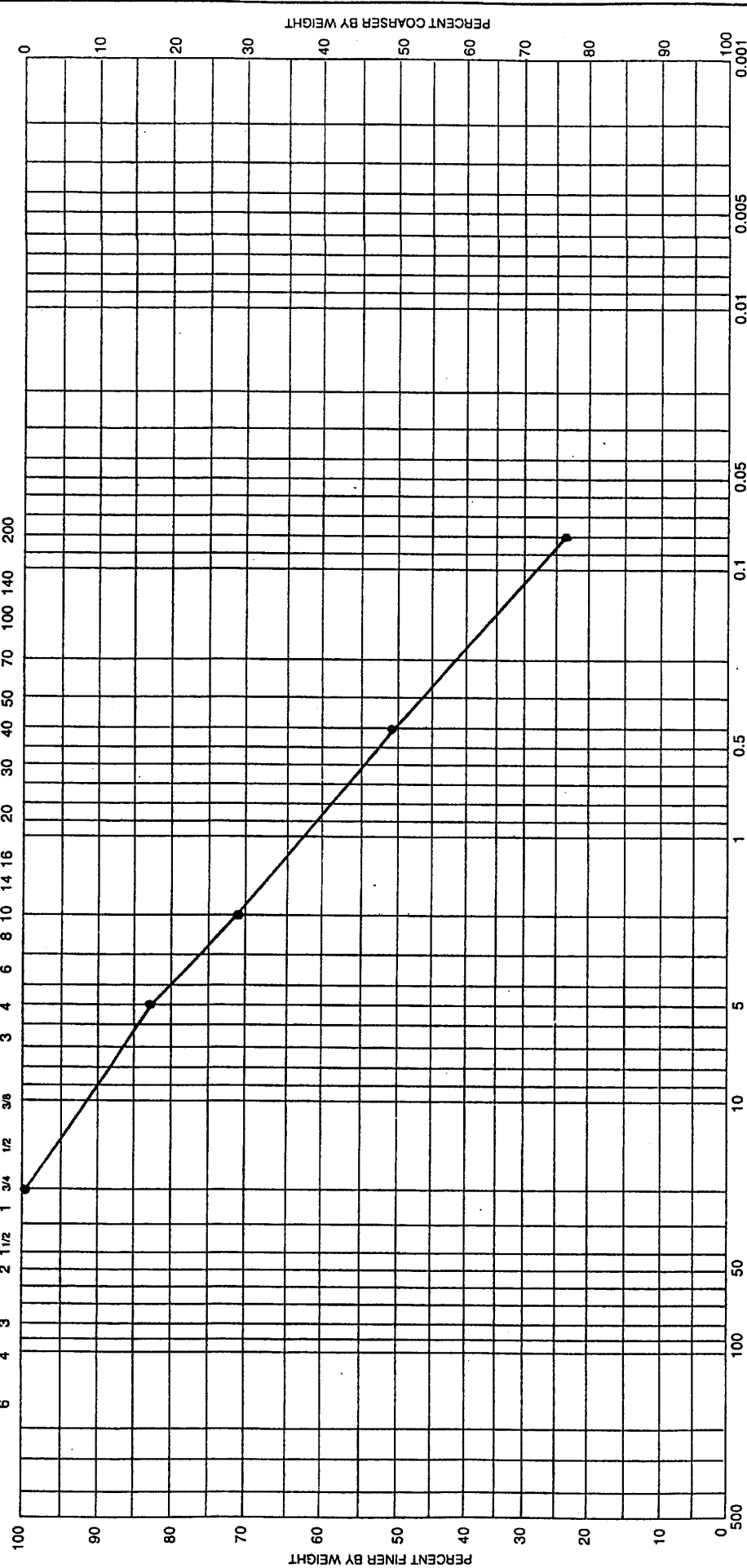


COBBLES			GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	COARSE		NEUTRAL	FINE	
Sample No.	Elev or Depth	Classification						
TB-1 - 47	235'	Sand: Light Tan						
		Fine Grain With Small Pea						
		Gravel (15%) (SC)						
		Net w %	LL	PL	PI			
		Area						
		Boring No.	TB-1					
		Date	7-5-94					
GRADATION CURVES								
Project: Amarillo MSW-LF								

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



GRAIN SIZE IN MILLIMETERS

COBBLES		GRAVEL		SAND			SILT OR CLAY	
		COARSE	FINE	NEUTRAL	FINE			
Sample No.	Elev or Depth	Classification						PI
TB-1 - 49	245'	Sand: Light Tan Fine Grain With Small Pea Gravel (15%) (SC)						NP
		Net w %						PL
								LL

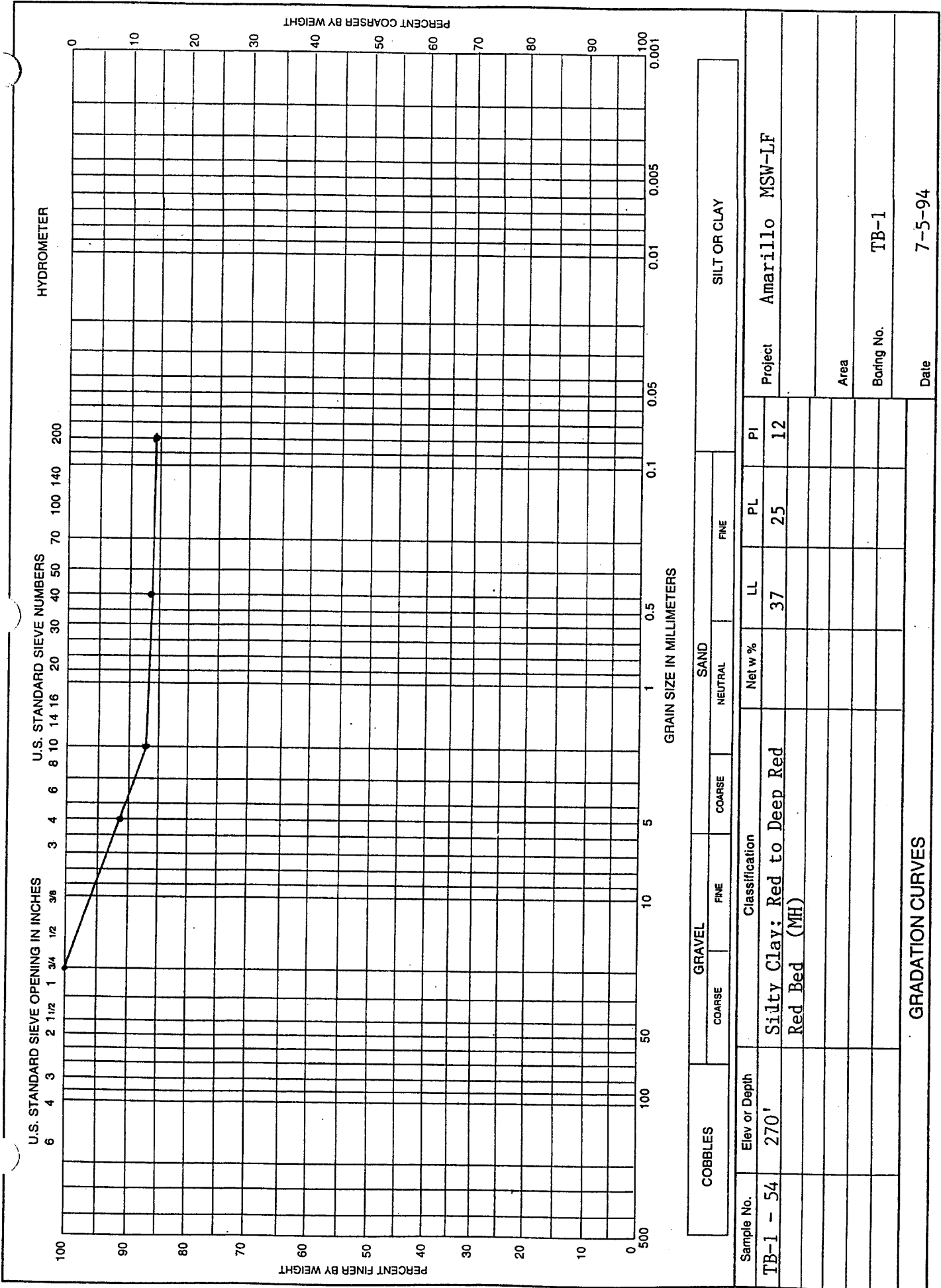
Project Amarillo MSW-LF

Area

Boring No. TB-1

Date 7-5-94

GRADATION CURVES



COBBLES		GRAVEL		SAND		SILT OR CLAY	
	COARSE	FINE	COARSE	NEUTRAL	FINE		
Sample No.	Classification						PI
TB-1 - 54	Silty Clay: Red to Deep Red Red Bed (MH)						12
Elev or Depth	Net w %						PL
270'	37						25
	Project						MSW-LF
	Area						
	Boring No.						TB-1
	Date						7-5-94

GRADATION CURVES

**LOG OF BORING**

**TB - 2**

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: TB-2  
 LOCATION: Amarillo, Texas

Date: 7-12-94 thru 7-15-94

Ground Elevation: 3686.34

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE	
			GROUNDWATER INFORMATION: Air Drilled to 85' Mud Drilled to 180'										
DESCRIPTION OF STRATUM													
0	(Symbol: Diagonal lines down-right)	X	Clayey Sand: Tan w/Calcareous Nodules, Well Sorted, Dry (SC)			7.6		20	16	4		29.2	
5	(Symbol: Diagonal lines down-right)	X			7-6"	3.3		19	17	2	4.0+	25.5	
					14-12"								
					20-18"								
10	(Symbol: Diagonal lines down-right)	X	Caliche: Light Tan Limestone Cap, Fractures, Hard, Dry (CL)										
15	(Symbol: Diagonal lines down-right)												
20	(Symbol: Diagonal lines down-right)	X											
					19-6"	3.6		27	24	3		8.9	
			50-11.5'										
25	(Symbol: Diagonal lines down-right)	X	Clayey Sand: Light Tan to Reddish w/Calcareous Nodules(15%) Dry(SC)		27-6"	3.7				NP		13.9	
					50-11.5'								
30	(Symbol: Diagonal lines down-right)		Continued on Page 2										

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: TB-2  
 LOCATION: Amarillo, Texas

Date: 7-12-93 thru 7-15-94

Ground Elevation: 3686.34

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 85' Mud Drilled to 180'									
			DESCRIPTION OF STRATUM									
30	○	X	Becoming Hard									
35	○	X	40-6"	50-6.5"	5.5					NP	3.5	12.1
40	○	X	31-6"	50-9.5"	4.9		25	20	5			15.4
45	○	X	28-6"	50-10"	5.8					NP	2.0	11.9
50	○	X	30-6"	50-9"	4.9		25	20	5			15.4
55	○	X	31-6"	50-9"	4.9		24	19	5			8.9
60	○											

Continued on Page 3



## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: TB-2  
 LOCATION: Amarillo, Texas

Date: 7-12-94 thru 7-15-94

Ground Elevation: 3686.34

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air drilled to 85' Mud drilled to 180'									
			DESCRIPTION OF STRATUM									
60	○	X										
			22-6"		5.0							7.6
			50-11"									
65	○	X										
			18-6"		5.5							7.9
			44-12"									
70	○	X										
			50-6"		5.1							26.0
75	○	X	Clayey Sand: Reddish Brown w/Calcareous Nodules(12%) Fine Grain (SC)									
			17-7"		7.6					2.25		6.5
			50-12"									
80	○	X	Clayey Sand: Reddish Tan w/Pea Size Gravel & Fine Grain (SC)									
			34-6"		4.6							10.1
			50-18"									
85	○	X	Increasing Coarse Gravels Organic Carbon Content(*) *1044.53 MG/KG									
			4-6"		MD		20	14	6			23.2
			11-12"									
			27-18"									
90	○		Continued on Page 4									

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: TB-2  
 LOCATION: Amarillo, Texas

Date: 7-12-94 thru 7-15-94

Ground Elevation: 3686.34

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air drilled to 85' Mud drilled to 180'									
90	/ / / / /	X			23-6" MD							86.2
					50-12.5"							
95		X	Silty Clay: Red to Green, Dense (MH) *313.52 MG/KG K = 4.72 X 10 <sup>-9</sup> cm/sec		36-6" MD		46	24	22			83.1
					50-12"							
100	X X X X X	X	Silty Clay: Red Dense, w/Pea Size Gravel (8%) (MH)		50-4.5" MD		39	22	17	4.0		82.6
105		X	Silty Clay: Light Green, Dense (MH) *258.68 MG/KG		50-6" MD		40	21	19	3.25		73.1
110		X			50-4" MD		29	12	17			88.2
115		X	Silty Clay: Dark Red, Dense (MH)		50-5" MD		37	18	19			79.7
120			Continued on Page 5									

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: TB-2  
 LOCATION: Amarillo, Texas

Date: 7-12-94 thru 7-15-94

Ground Elevation: 3686.34

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air drilled to 85' Mud drilled to 180'									
120												
-125	X		*271.65 MG/KG		50-4"	MD		36	16	20		65.2
-130												
-135	X		$K = 8.21 \times 10^{-10}$		50-3.5"	MD		34	15	19		93.4
-140												
-145	X		Silty Clay: Dark Red Silty Clay, w/Brown Silty Stringers, Dense(MH) *343.71 MG/KG		50-3"	MD		34	15	19		87.2
-150			Continued on Page 6									

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

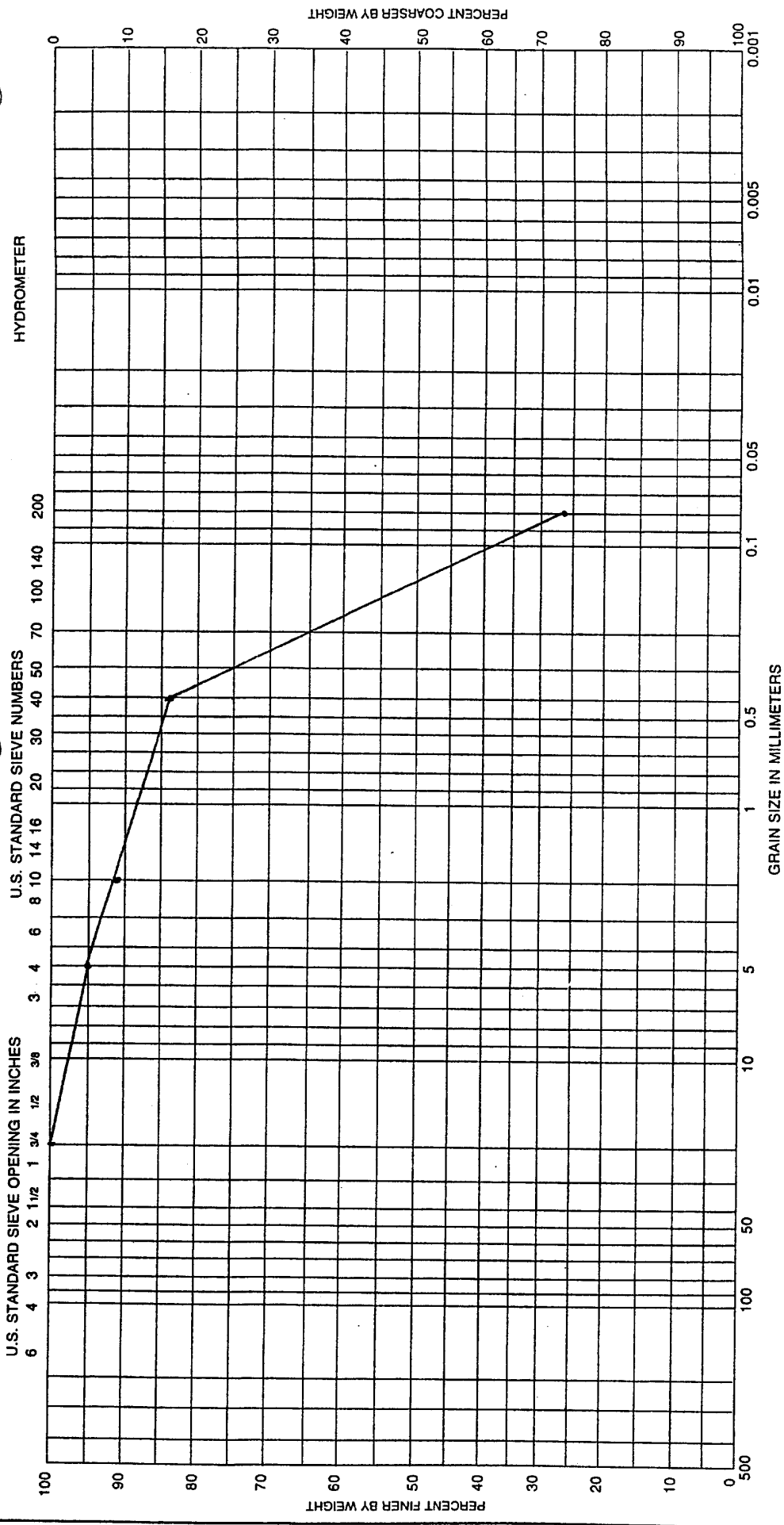
BORING NO.: TB-2  
 LOCATION: Amarillo, Texas

Date: 7-12-94 thru 7-15-94

Ground Elevation: 3686.34

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE		
			GROUNDWATER INFORMATION: Air drilled to 85' Mud drilled to 180'										DESCRIPTION OF STRATUM	
150			Silty Clay: Reddish Brown, Dense (MH)											
-155	X				50-3"	MD	35	16	19			70.5		
160					Silty Clay: Light Green to Brown, Dense (MH)									
-165	X						50.3"	MD	39	18	21			68.0
170			Silty Clay: Reddish Brown (MH)											
-175														
180					Continued on Page 7									



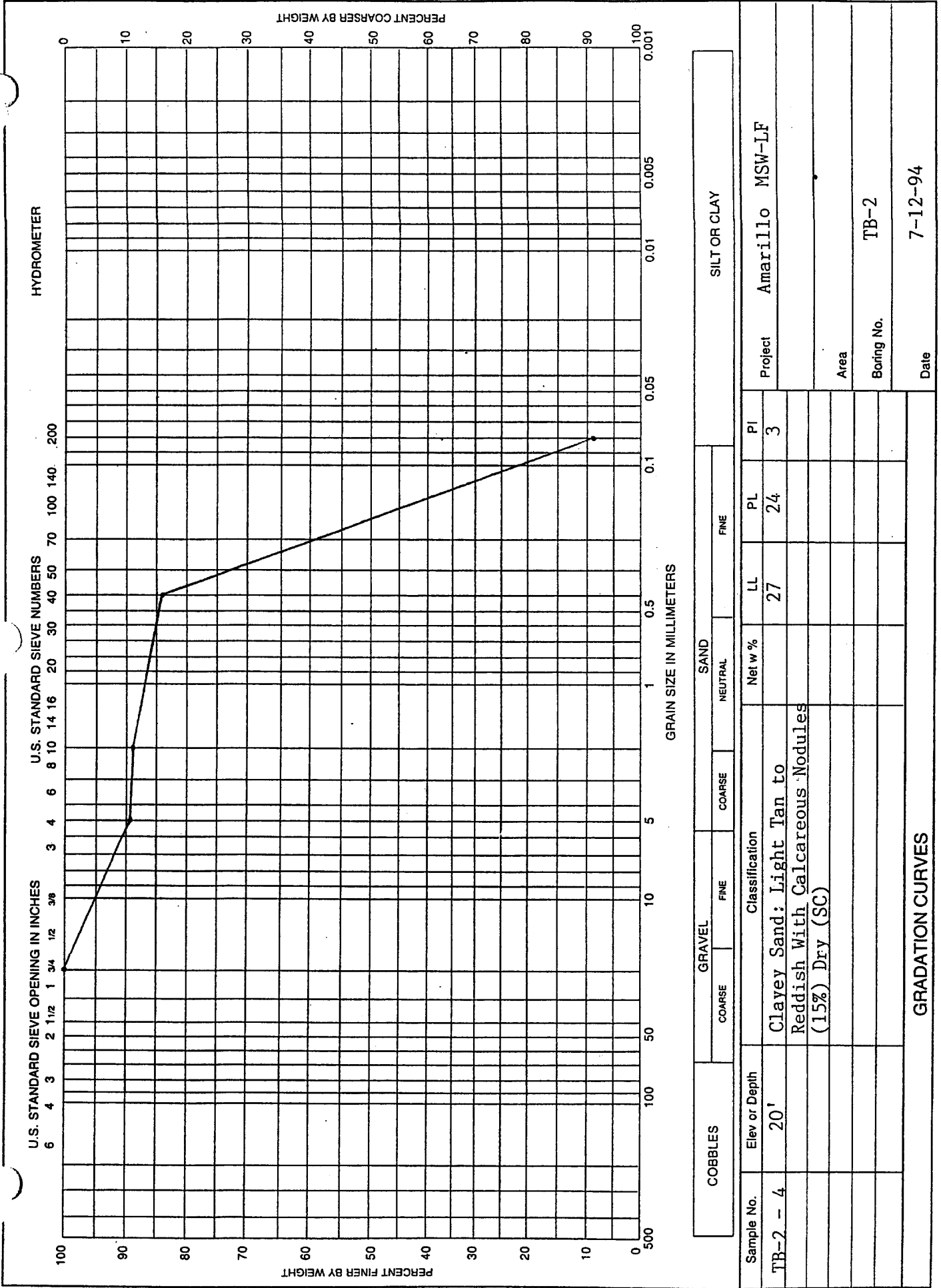


Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
TB-2 - 1	5'	Clayey Sand: Tan With Calcareous Nodules Well Sorted, Dry (SC)	19	17	.2	

COBBLES		GRAVEL		SAND			SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	FINE		
							Project	Amarillo MSW-LF
							Area	
							Boring No.	TB-2
							Date	7-12-94

GRADATION CURVES



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

SILT OR CLAY

GRAVEL

COARSE FINE

SAND

NETRAL COARSE FINE

COARSE FINE

Sample No. TB-2 - 4

Elev or Depth 20'

Classification

Clayey Sand: Light Tan to  
Reddish With Calcareous Nodules  
(15%) Dry (SC)

PI

3

PL

24

LL

27

Net w %

Project Amarillo MSW-LF

Area

Boring No. TB-2

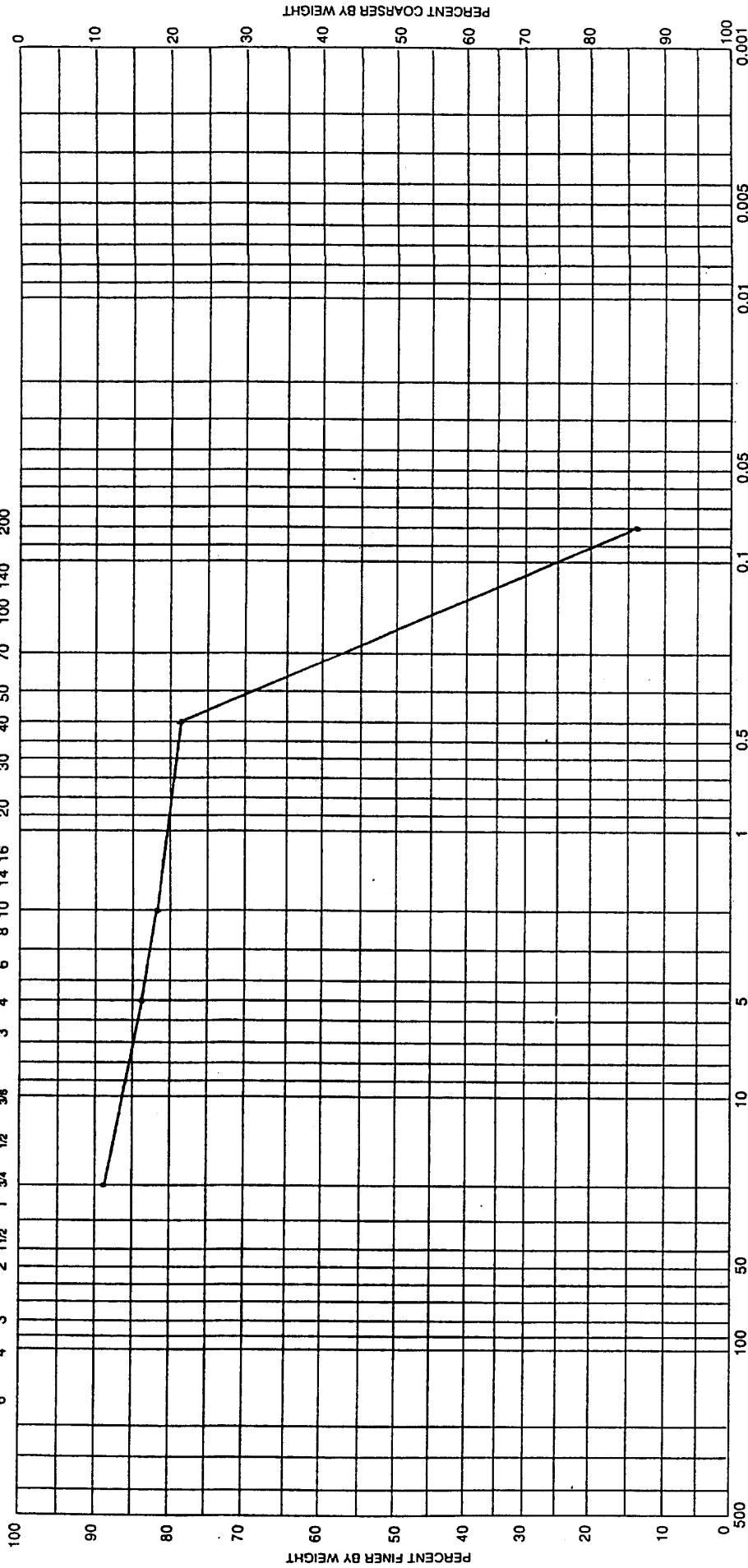
Date 7-12-94

GRADATION CURVES

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



GRAIN SIZE IN MILLIMETERS

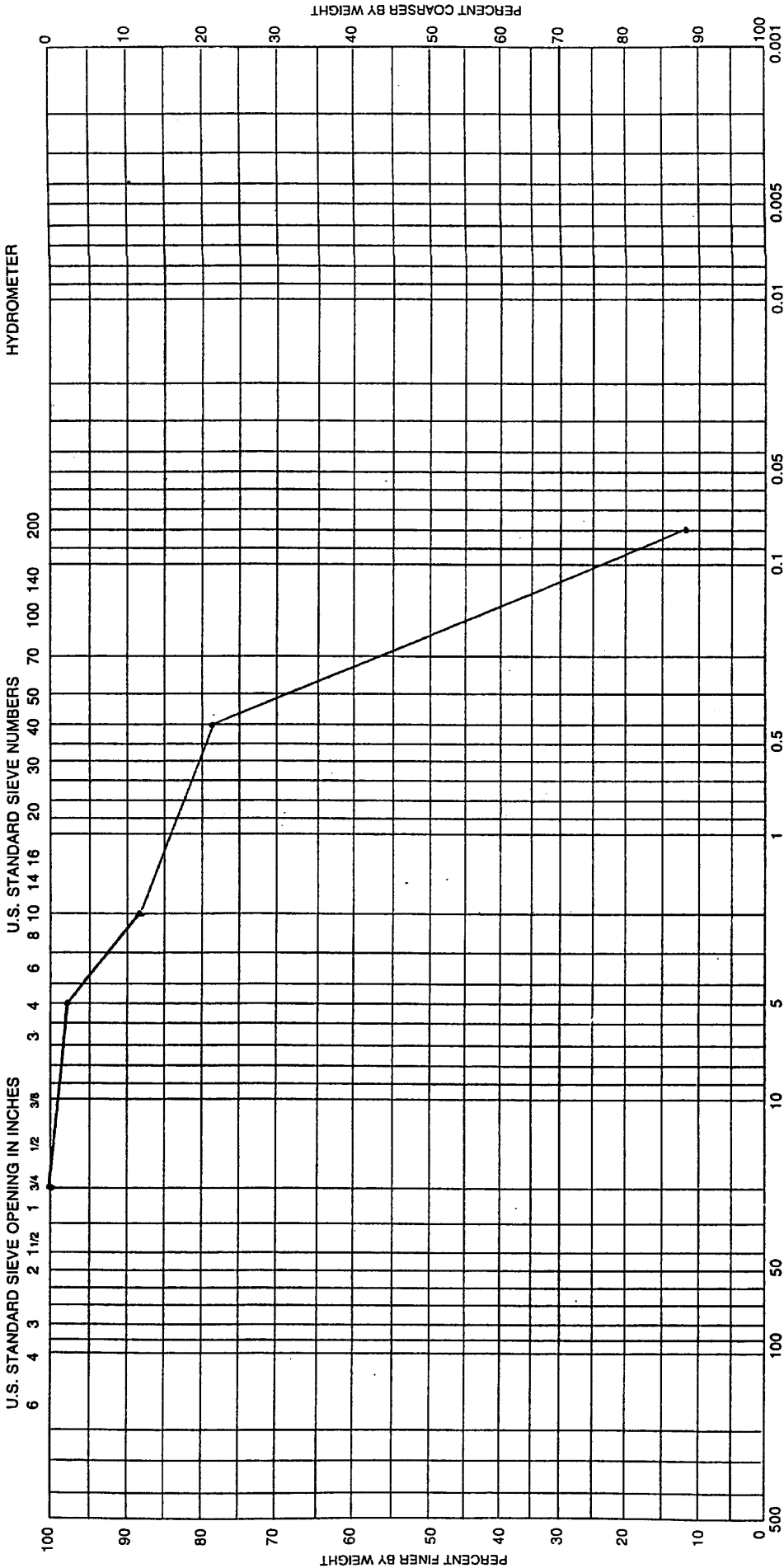
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
TB-2 - 5	25'	Clayey Sand: Light Tan to Reddish, With Calcareous Nodules (15%) Dry (SC)				NP

Project	Amarillo MSW-LF
Area	
Boring No.	TB-2
Date	7-12-94

GRADATION CURVES

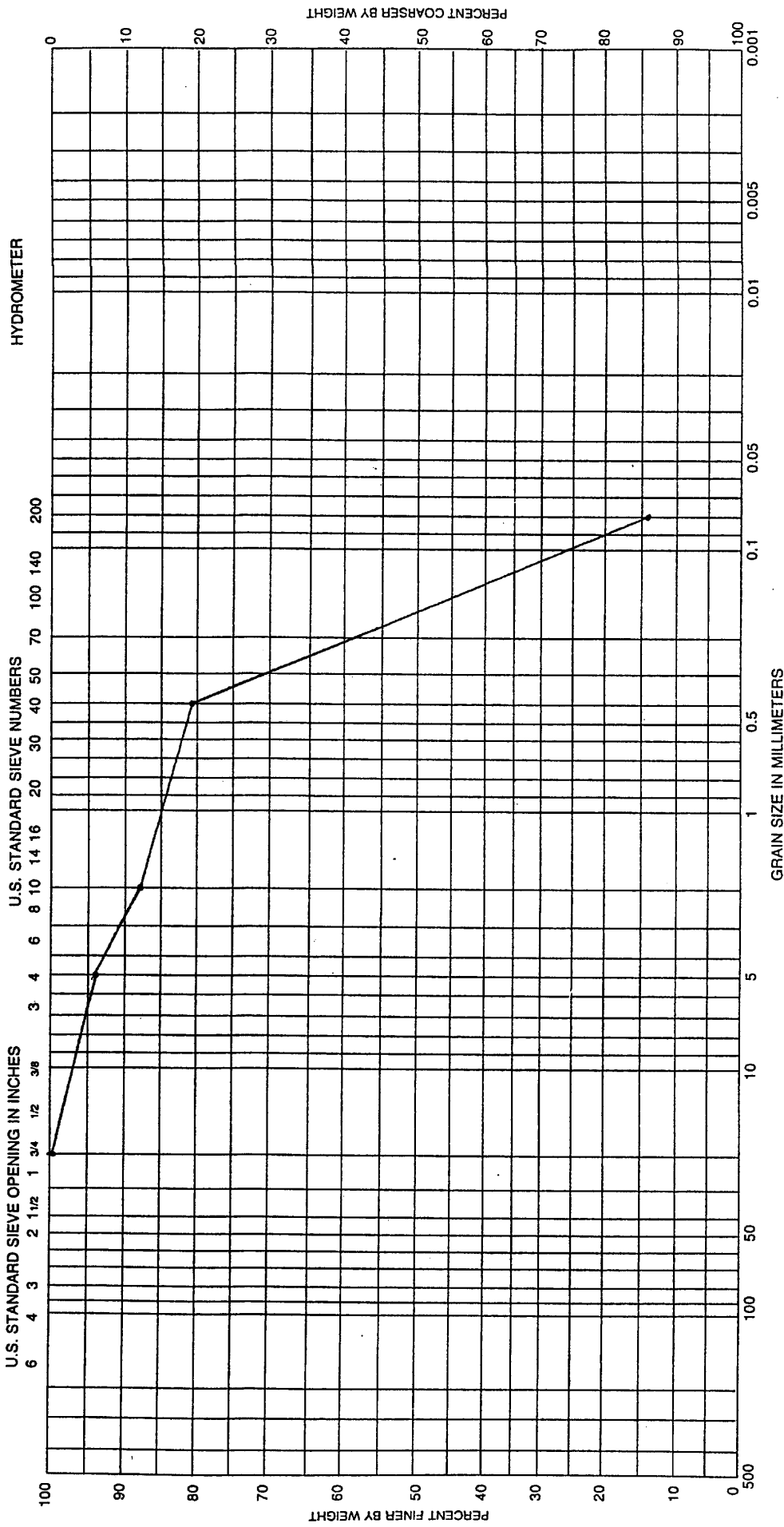




Sample No.	Elev or Depth	Classification	GRAVEL			SAND			PI
			COARSE	FINE		NEUTRAL	FINE		
TB-2-6	30'	Clayey Sand: Light Tan to Reddish, with Calcareous Nodules (15%) Dry (SC)						NP	

COBBLES		SILT OR CLAY		
Project	Amarillo MSW-LF			
Area				
Boring No.	TB-2			
Date	7-12-94			

**GRADATION CURVES**



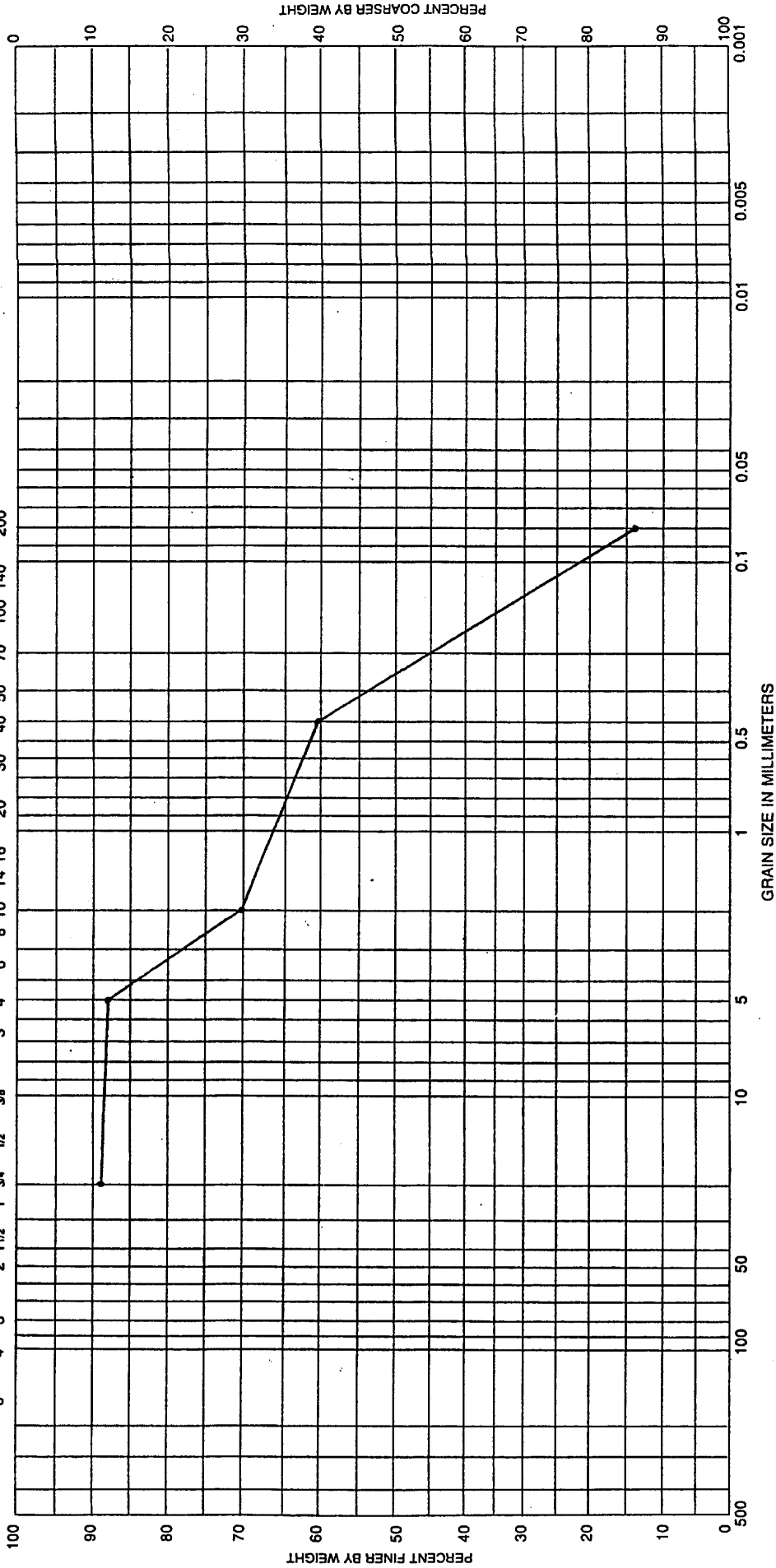
Sample No.	Elev or Depth	Classification	SAND			PI	SILT OR CLAY
			Net w %	LL	PL		
TB-2 - 7	35'	Clayey Sand: Light Tan To Reddish, With Calcareous Nodules (15%) Dry (SC)				NP	Amarillo MSW-LF
							Area
							Boring No. TB-2
							Date 7-12-94

GRADATION CURVES

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

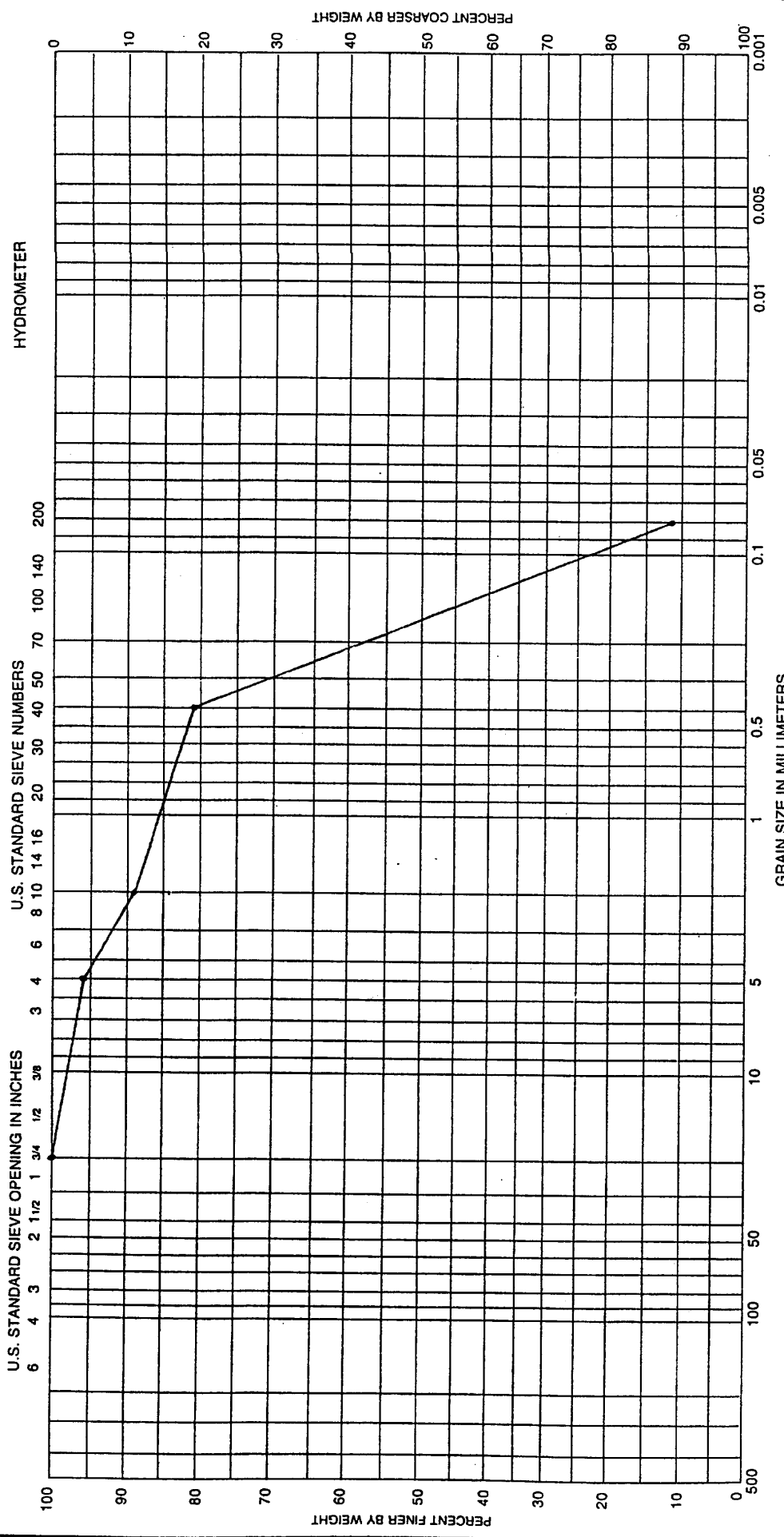
U.S. STANDARD SIEVE OPENING IN INCHES



COBBLES	GRAVEL		SAND		SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
TB-2 - 8	40'	Clayey Sand: Light Tan to Reddish, With Calcareous Nodules (15%) Dry (SC)		25	20	5	Amarillo MSW-LF
							Area
							Boring No.
							TB-2
							Date
							7-12-94

GRADATION CURVES

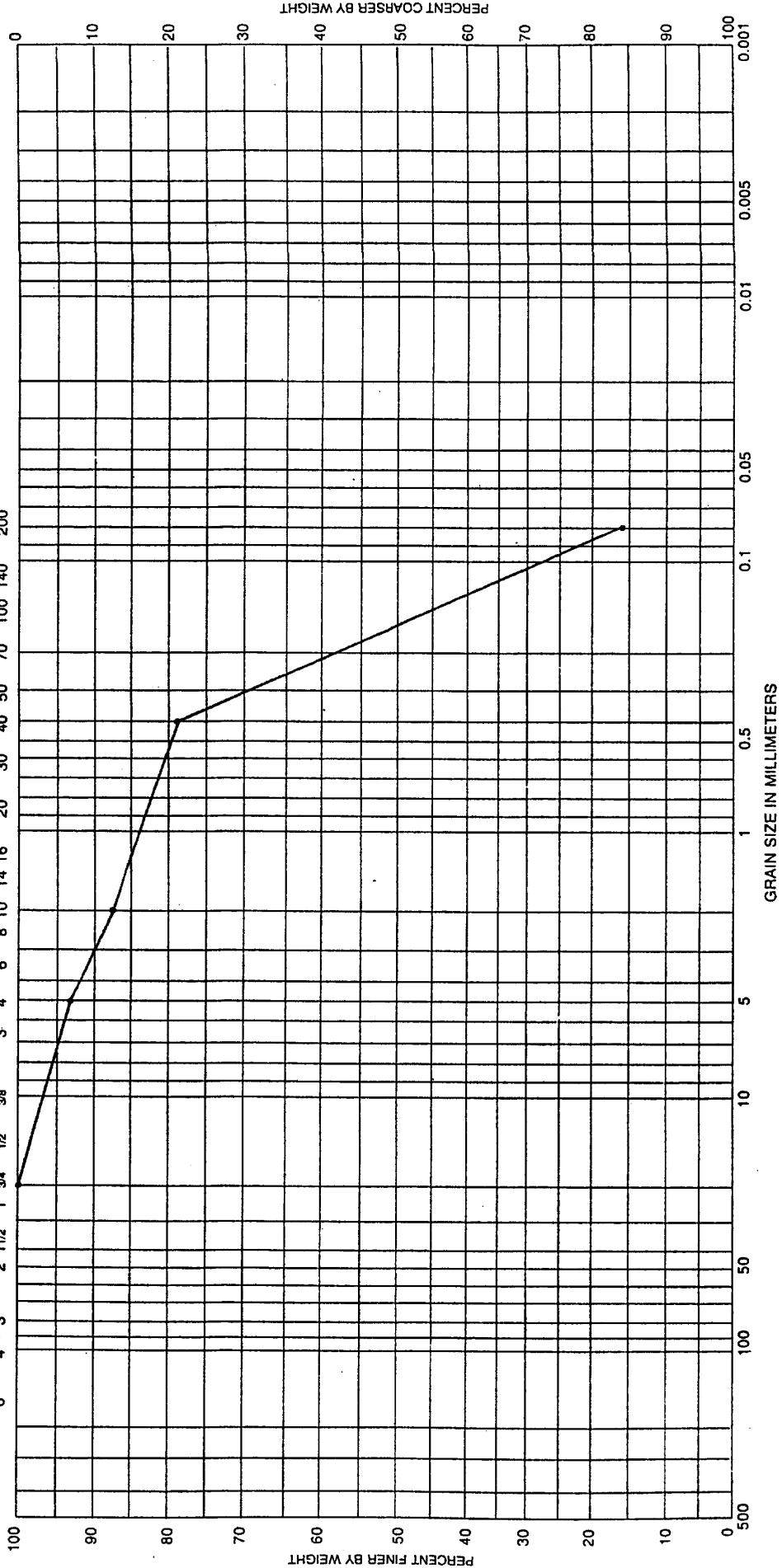


COBBLES		GRAVEL		SAND			SILT OR CLAY			
		COARSE	FINE	COARSE	NEUTRAL	FINE				
Sample No.	Elev or Depth	Classification					PI			
TB-2 - 9	45'	Clayey Sand: Light Tan to Reddish, With Calcareous Nodules (15%) Dry (SC)					NP	Project		
								Amarillo MSW-LF		
								Area		
								Boring No.		
								TB-2		
								Date		
								7-12-94		
<b>GRADATION CURVES</b>										

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



PERCENT COARSER BY WEIGHT

PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

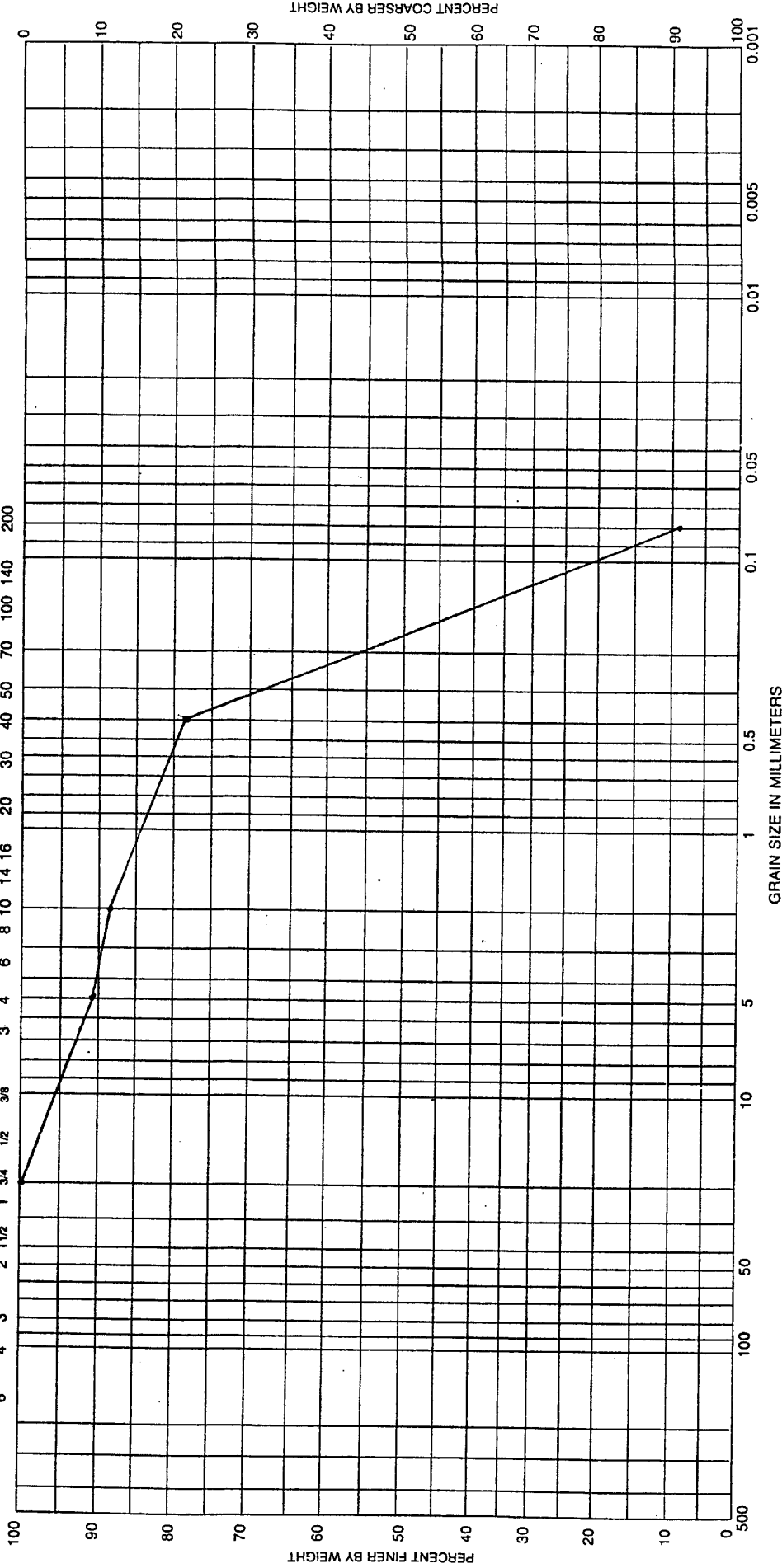
COBBLES		GRAVEL		SAND		SILT OR CLAY	
	COARSE	FINE	COARSE	NEUTRAL	FINE		
Sample No.	Elev or Depth	Classification				Project	
TB-2 - 10	50'	Clayey Sand: Light Tan to Reddish, with Calcareous Nodules (15%) Dry (SC)				Amarillo	MSW-LF
		Net w %	LL	PL	PI		
			25	20	5		
						Area	
						Boring No.	TB-2
						Date	7-12-94

GRADATION CURVES

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
TB-2 - 11	55'	Clayey Sand: Light Tan to Reddish, with Calcareous Nodules (15%) Dry (SC)		24	19	5

Project Amarillo MSW-LF

Area

Boring No. TB-2

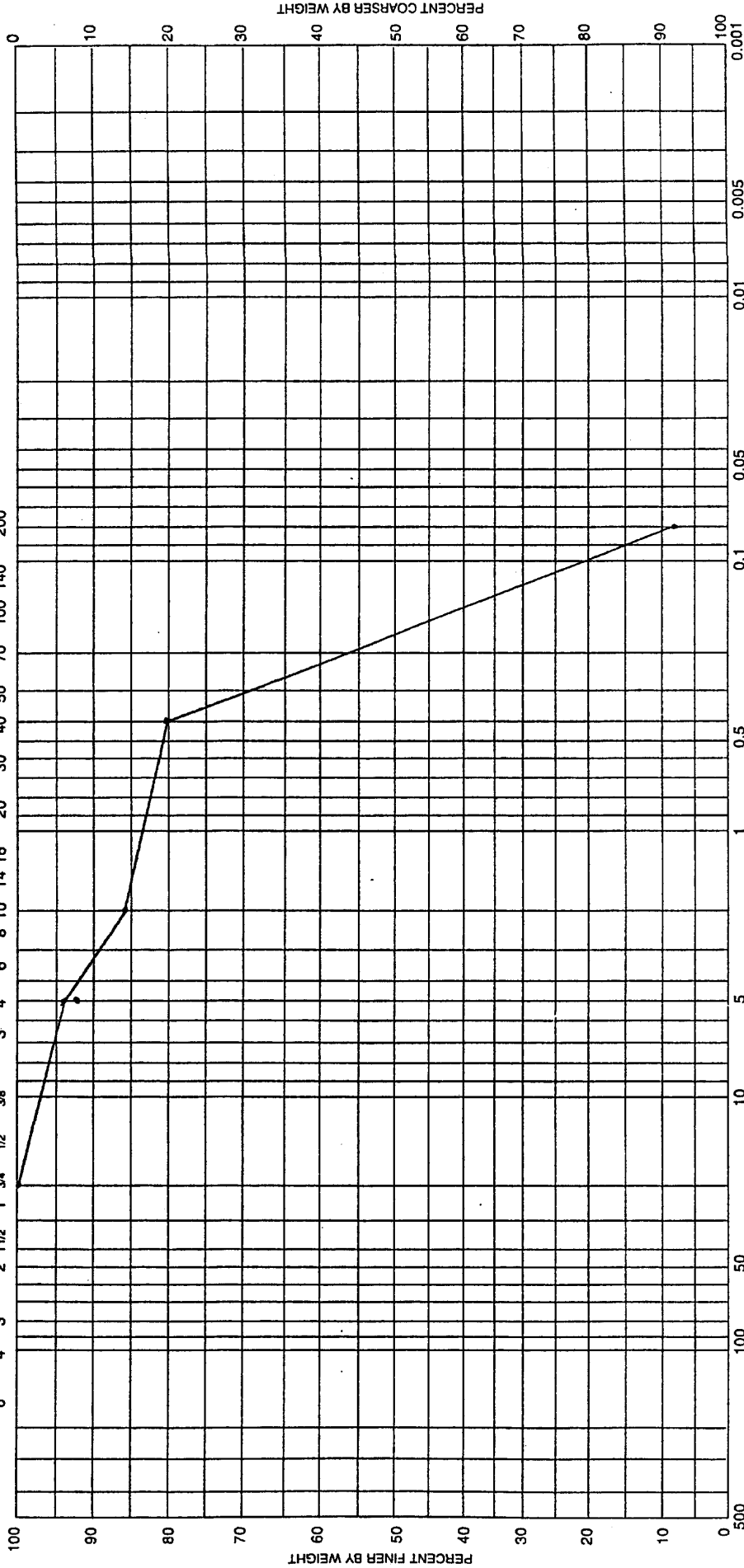
Date 7-12-94

GRADATION CURVES

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

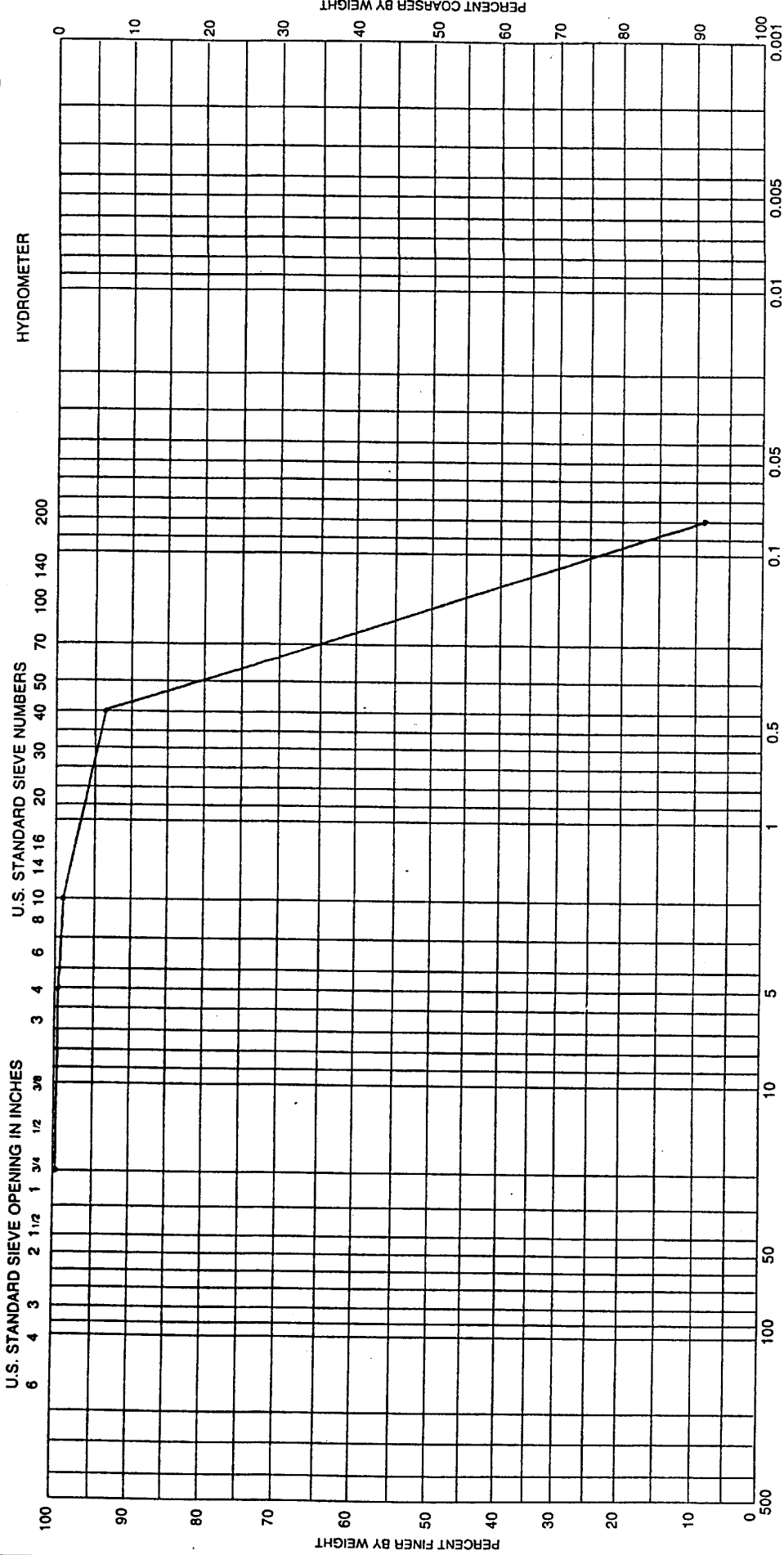
U.S. STANDARD SIEVE OPENING IN INCHES



GRAIN SIZE IN MILLIMETERS

COBBLES	GRAVEL		SAND			SILT OR CLAY		
	COARSE	FINE	NEUTRAL	COARSE	FINE	CL	ML	MSW-LF

Sample No.	Elev or Depth			Net w %	LL	PL	PI	Project
TB-2 - 12	60'						NP	Amarillo MSW-LF
	Classification							Area
	Clayey Sand: Light Tan to Reddish, With Calcareous Nodules (15%) Dry (SC)							Boring No.
								TB-2
	GRADATION CURVES							Date
								7-12-94



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

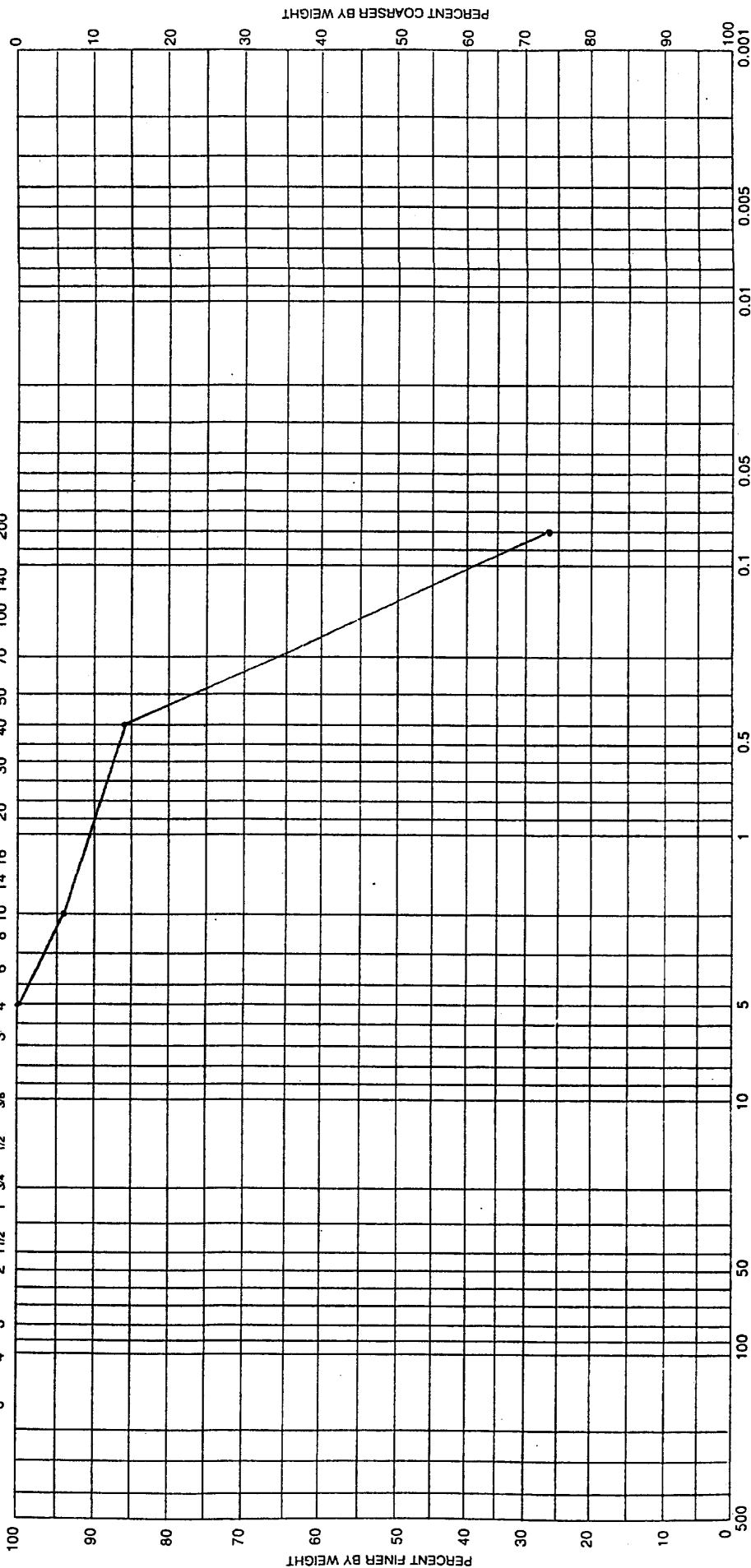
COBBLES		GRAVEL		SAND			SILT OR CLAY				
		COARSE	FINE	COARSE	NEUTRAL	FINE					
Sample No.	Elev or Depth	Classification									
TB-2 - 13	65'	Clayey Sand: Light Tan to Reddish, With Calcareous Nodules (15%) Dry (SC)									
		Net w %	LL	PL	PI						
					NP						
		Area		Boring No.							
		Area		TB-2							
				Date		7-12-94					
<b>GRADATION CURVES</b>											



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



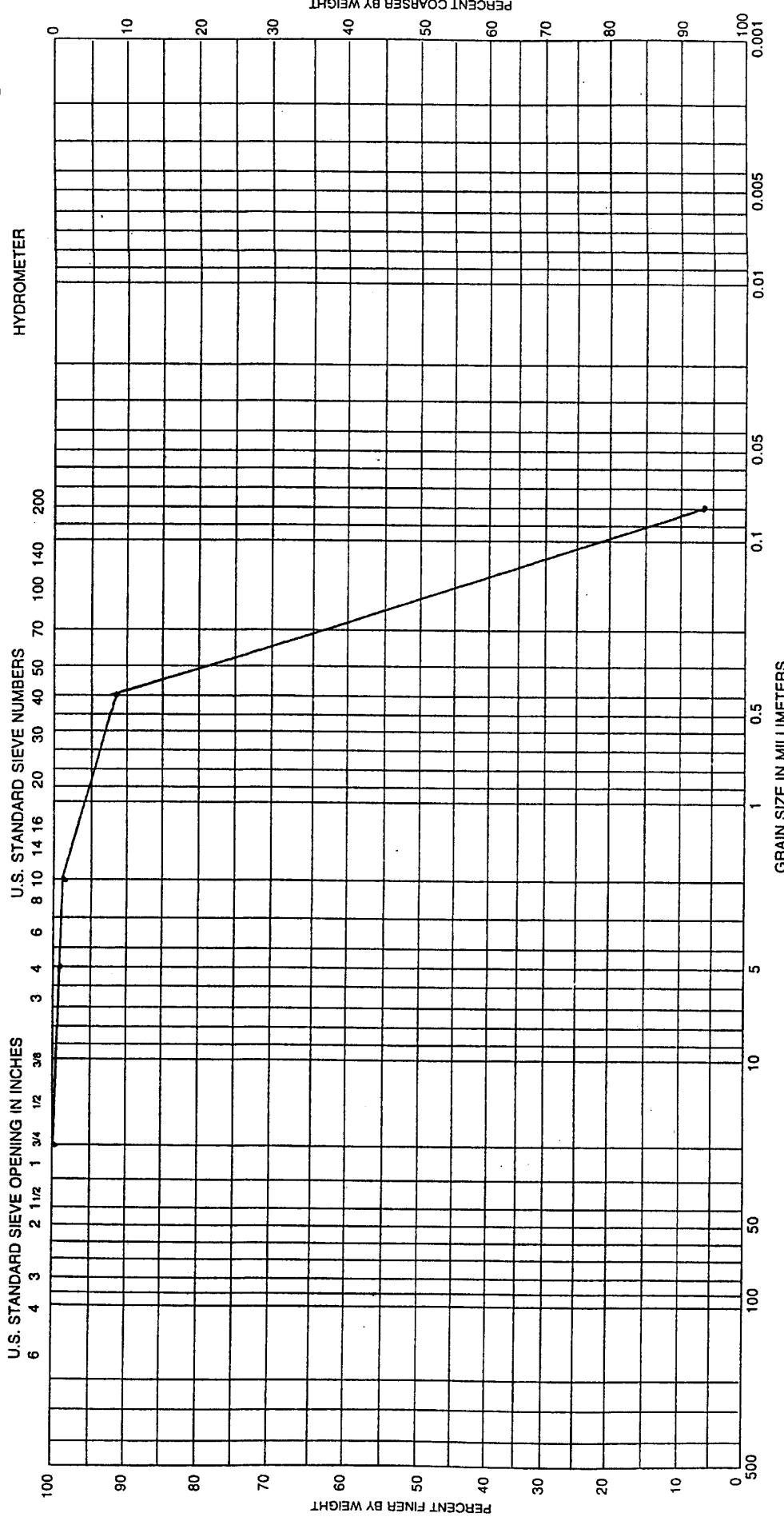
PERCENT COARSER BY WEIGHT

PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

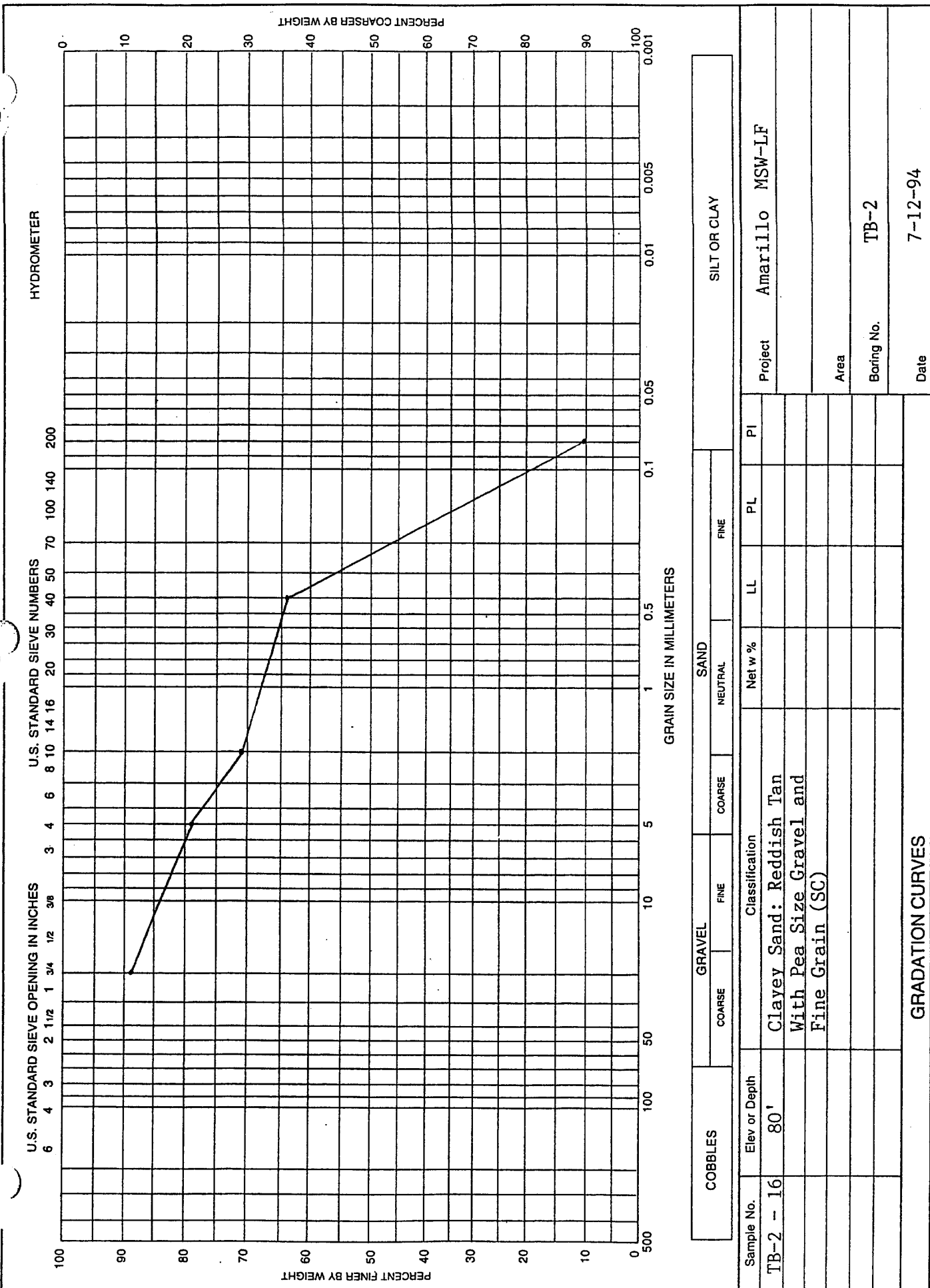
COBBLES		GRAVEL			SAND			SILT OR CLAY		
	COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI		
Sample No.	Classification									
TB-2 - 14	Clayey Sand: Light Tan to Reddish, With Calcareous Nodules (15%) Dry (SC)									
Elev or Depth	70'									
	Net w %	LL	PL	PI						
				NP						
	Area									
	Boring No. TB-2									
	Project Amarillo MSW-LF									
	Date 7-12-94									

GRADATION CURVES



COBBLES		GRAVEL			SAND			SILT OR CLAY			
		COARSE	FINE	NEUTRAL	COARSE	NEUTRAL	FINE	PL	PI		
Sample No.	Elev or Depth	Classification			Net w %	LL	PL	PI	Project	MSW-LF	
TB-2 - 15	75'	Clayey Sand: Reddish Brown With Calcareous Nodules (12%) Fine Grain (SC)							Amarillo	MSW-LF	
									Area	TB-2	
									Boring No.	7-12-94	
									Date		

**GRADATION CURVES**

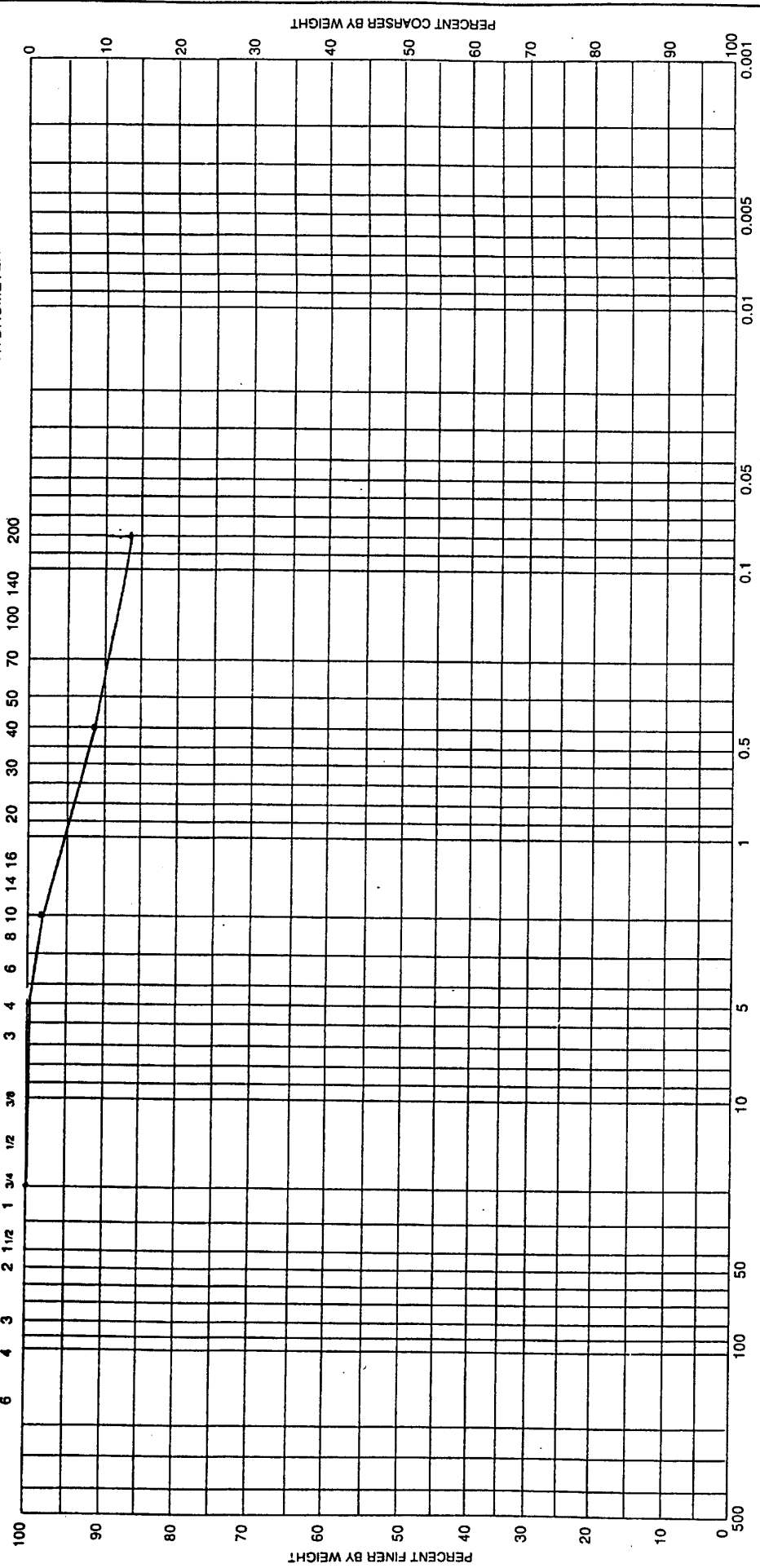


COBBLES	GRAVEL	SAND			SILT OR CLAY				
	COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI	
Sample No.	Classification							Net w %	
TB-2 - 16	Clayey Sand: Reddish Tan With Pea Size Gravel and Fine Grain (SC)								
Elev or Depth	80'								
Project	Amarillo MSW-LF								
Area									
Boring No.	TB-2								
Date	7-12-94								

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

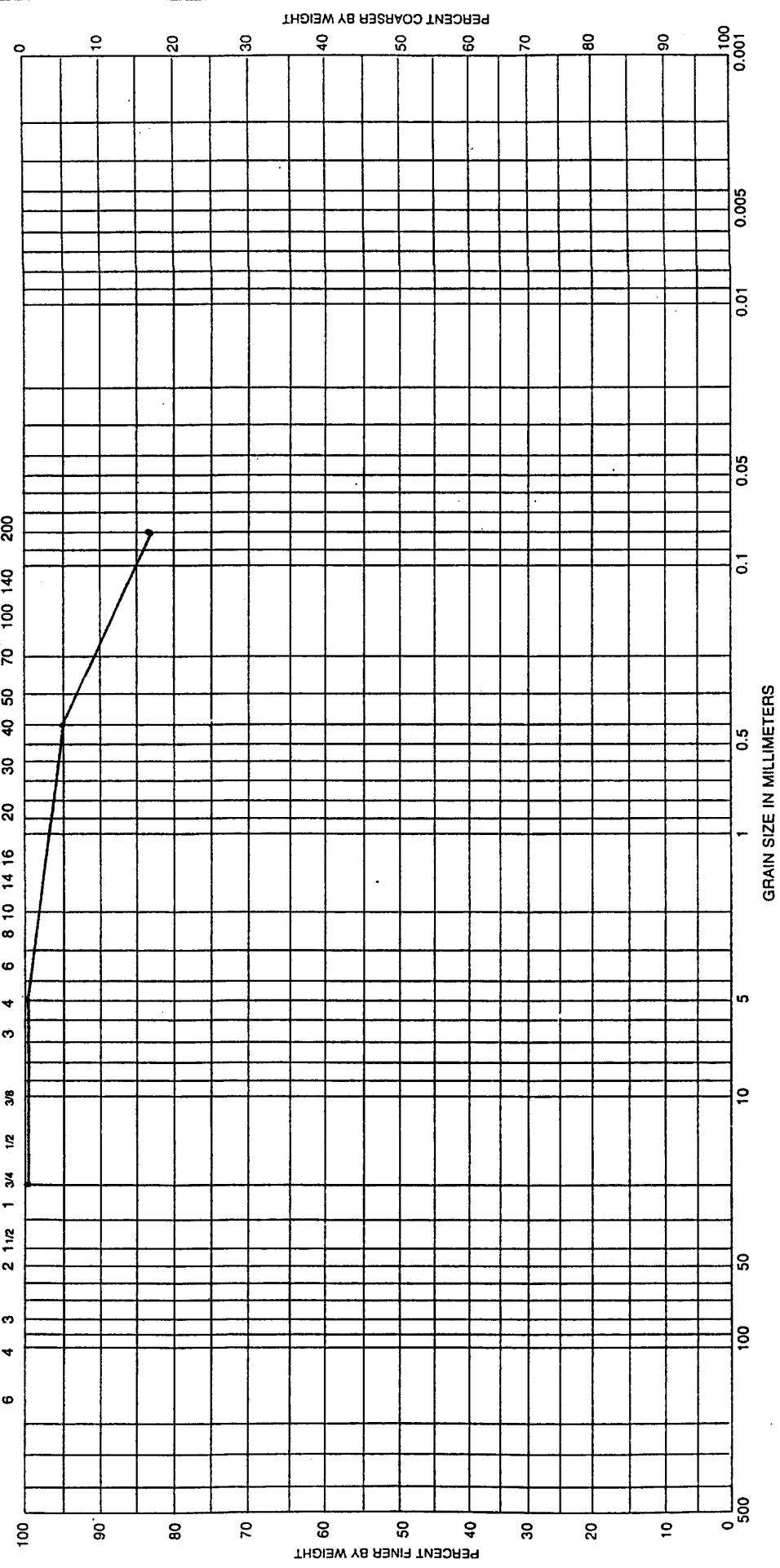


COBBLES		GRAVEL		SAND	
COARSE	FINE	COARSE	NEUTRAL	FINE	SILT OR CLAY
Classification					
Sample No.	Elev or Depth	Clayey Sand: Reddish Tan With Pea Size Gravel And Fine Grain (SC)		PI	Project
TB-2 - 18	90'			NP	Amarillo MSW-LF
					Area
					Boring No. TB-2
					Date 7-12-94
<b>GRADATION CURVES</b>					

U.S. STANDARD SIEVE OPENING IN INCHES

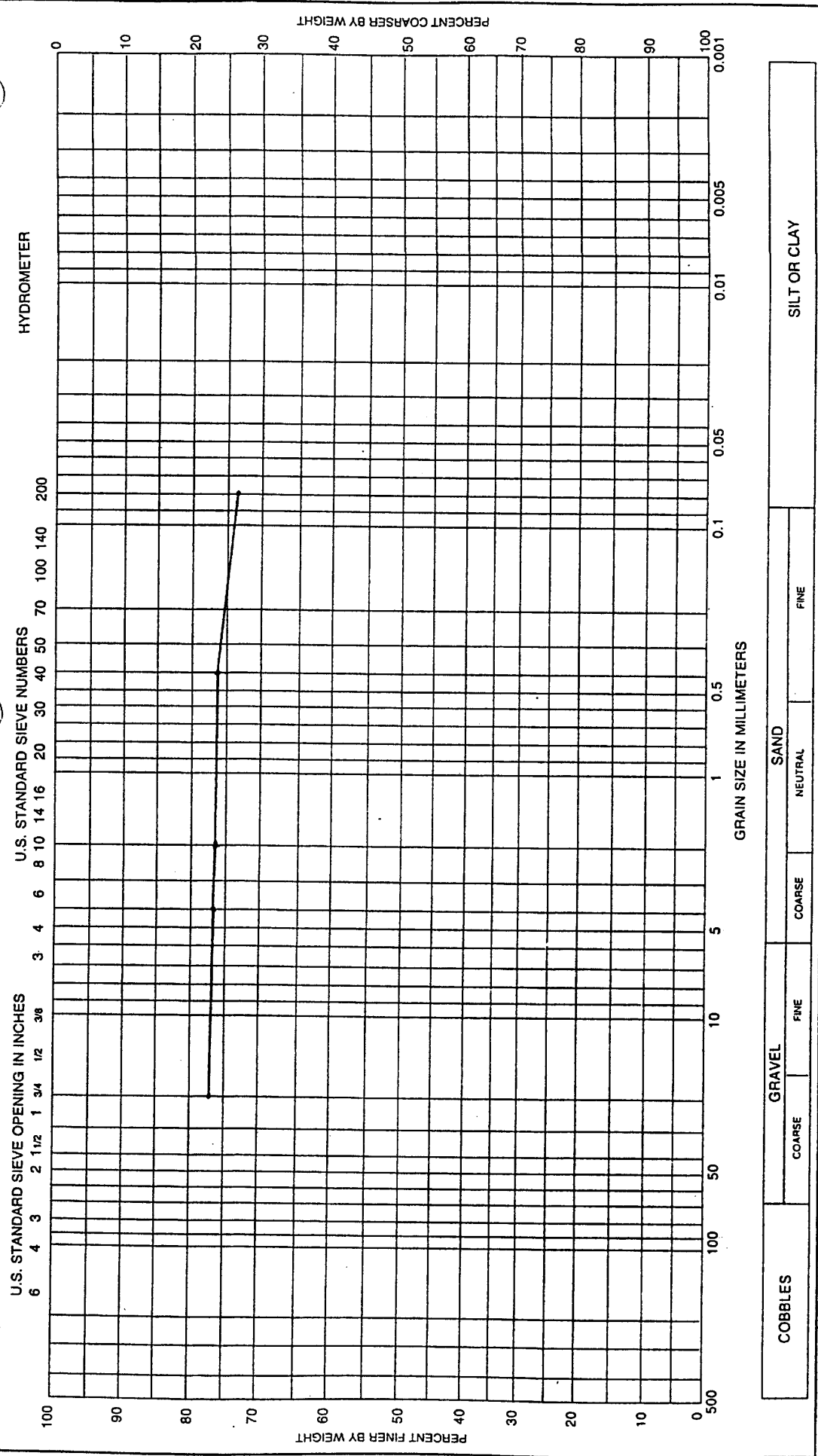
U.S. STANDARD SIEVE NUMBERS

HYDROMETER



COBBLES		GRAVEL		SAND		SILT OR CLAY	
COARSE		FINE		NEUTRAL		FINE	

Sample No.	Elev or Depth	Classification				PI
TB-2 - 20	100'	Silty Clay: Red Dense With Pea Size Gravel (8%) (MH)				17
		Net w %	LL	PL		
			39	22		
		Area	Boring No.		Date	
			TB-2		7-12-94	
GRADATION CURVES						



U.S. STANDARD SIEVE OPENING IN INCHES  
6 4 3 2 1 1/2 1 3/4 1/2 3/8 3/16 1/8 1/16 1/32 1/64 1/128 1/256 1/512 1/1024

U.S. STANDARD SIEVE NUMBERS  
10 20 30 40 50 60 70 80 90 100 120 150 200 250 300 400 500

GRAIN SIZE IN MILLIMETERS  
500 250 125 63 31 15 7 3 1 0.6 0.3 0.15 0.075 0.0475 0.025 0.015 0.0075 0.00475 0.0025 0.001

PERCENT FINER BY WEIGHT  
100 90 80 70 60 50 40 30 20 10 0

PERCENT COARSER BY WEIGHT  
0 10 20 30 40 50 60 70 80 90 100

COBBLES

GRAVEL: COARSE, FINE

SAND: COARSE, NEUTRAL, FINE

SILT OR CLAY

Sample No. TB-2 - 21

Elev or Depth 105'

Classification Silty Clay: Light Green Dense (MH)

Net w % 40

LL 40

PL 21

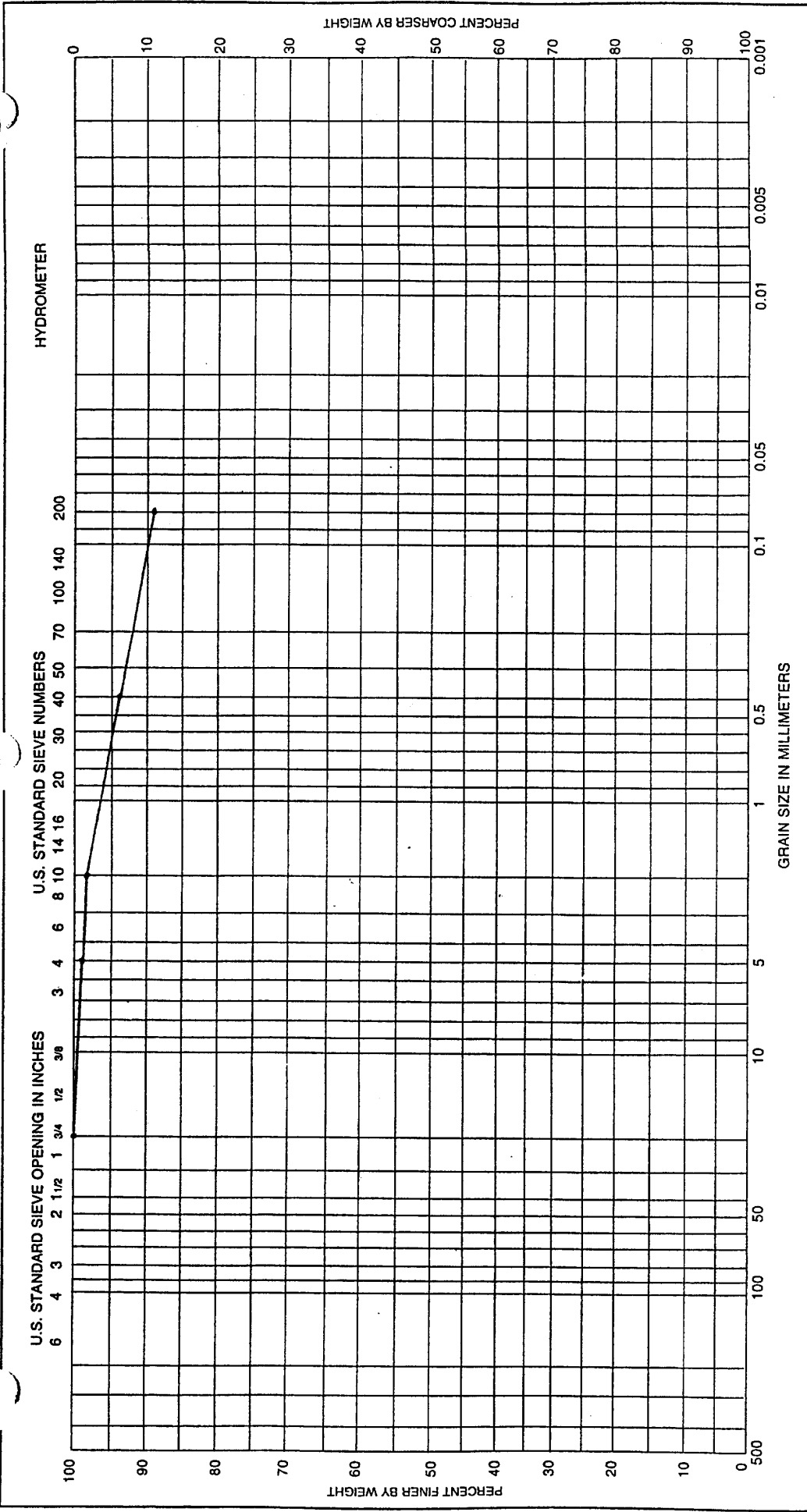
PI 19

Project Amarillo MSW-LF

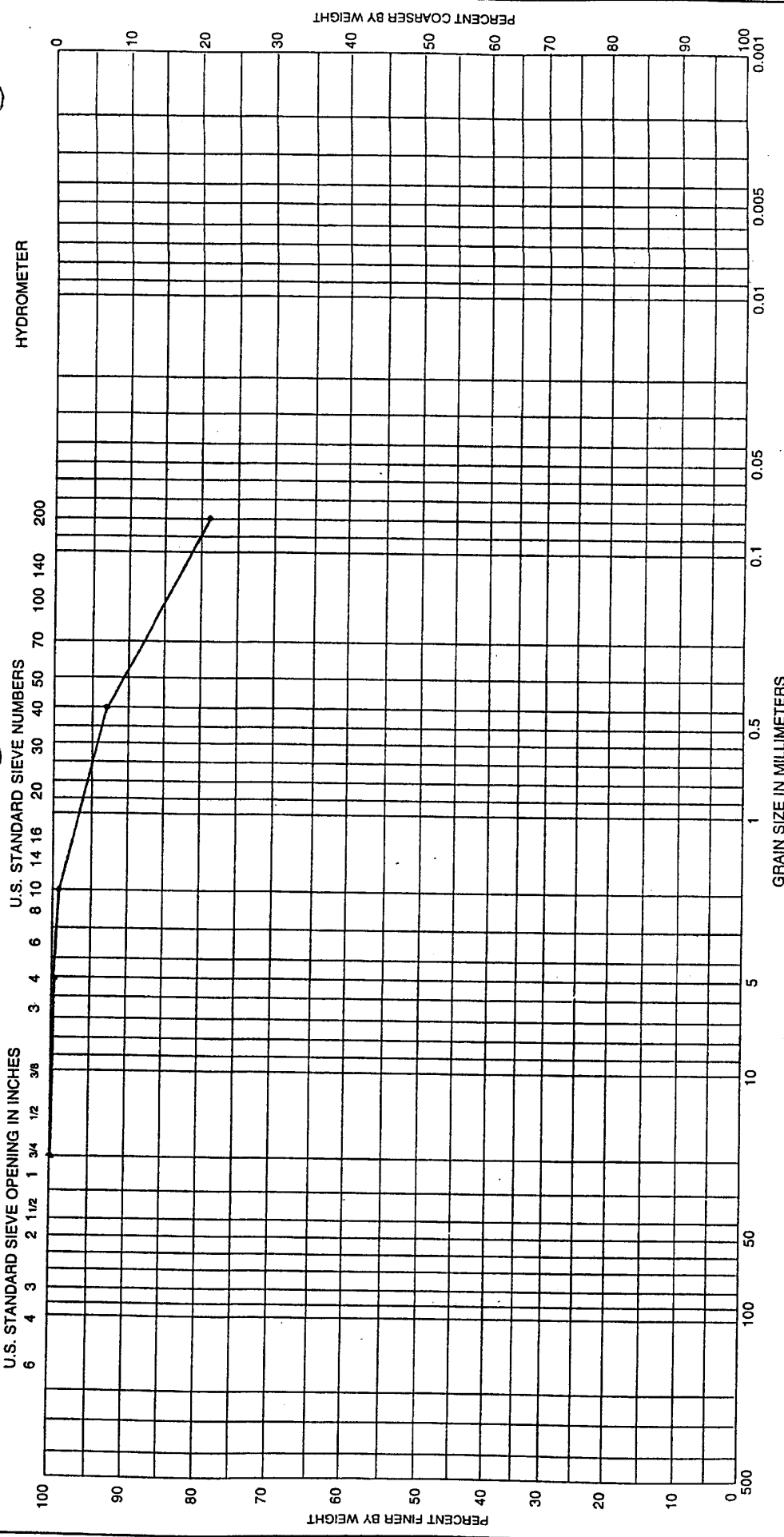
Area

Boring No. TB-2

Date 7-12-94



COBBLES	GRAVEL		SAND			SILT OR CLAY			
	COARSE	FINE	NEUTRAL	COARSE	FINE	PL	PI	Project	
Sample No.	Classification				Net w %	LL	PL		PI
TB-2 - 22	Silty Clay: Light Green Dense (MH)					29	12	17	Amarillo MSW-LF
Elev or Depth									Area
									Boring No.
									TB-2
GRADATION CURVES								Date	7-12-94



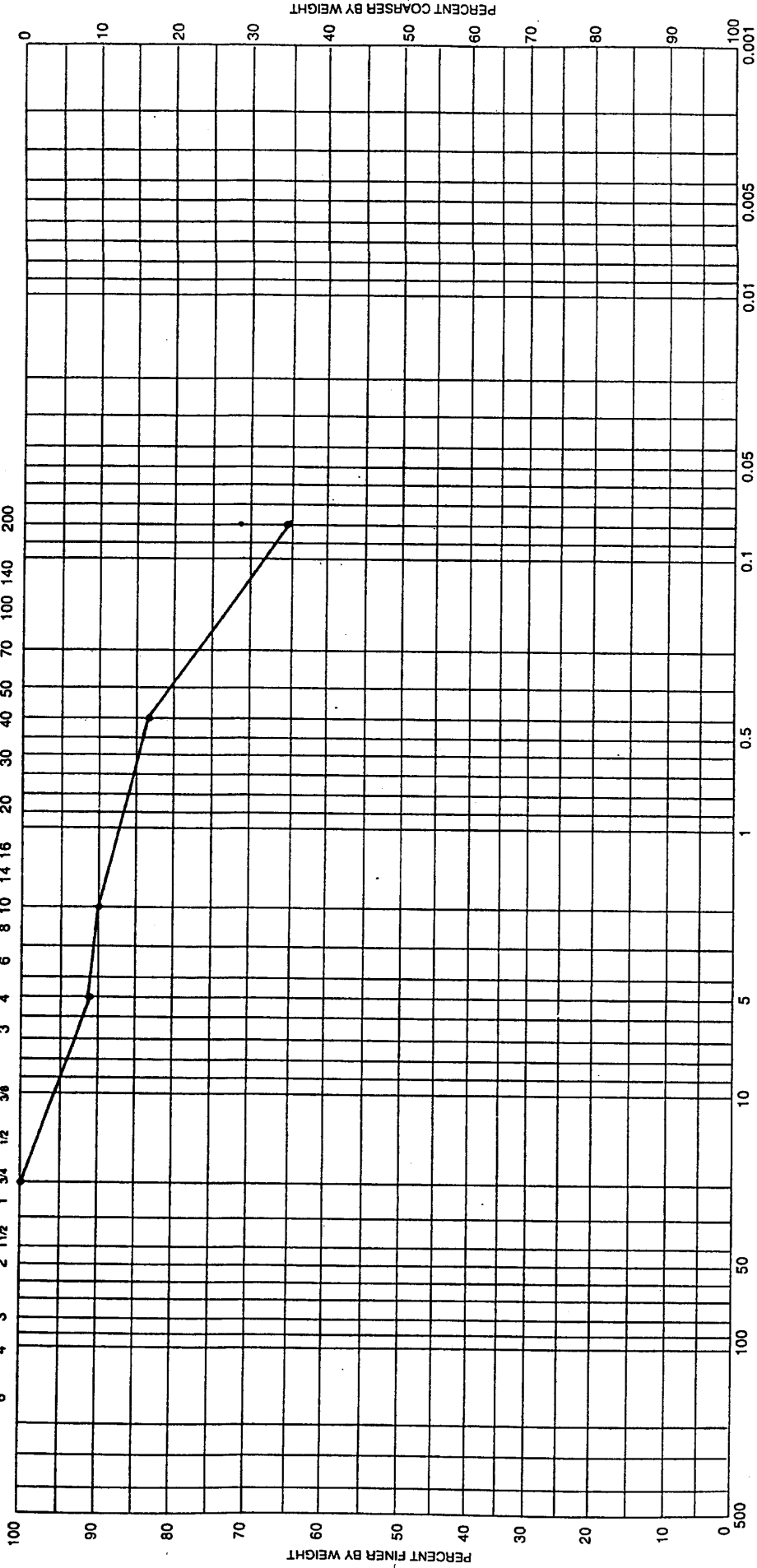
Sample No.	Elev or Depth	Classification	SAND			PI	PL	LL	Net w %	Project	Area	Boring No.	Date
			COARSE	NEUTRAL	FINE								
TB-2 - 23	115'	Silty Clay: Dark Red Dense (MH)				18	19	37	Amarillo MSW-LF		TB-2	7-12-94	
GRADATION CURVES													



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



GRAIN SIZE IN MILLIMETERS

COBBLES	GRAVEL		SAND		SILT OR CLAY	
	COARSE	FINE	NEUTRAL	FINE		

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
TB-2-25	125'	Silty Clay: Dark Red Dense (MH)		36	16	20

Project Amarillo MSWLF

Area

Boring No. TB-2

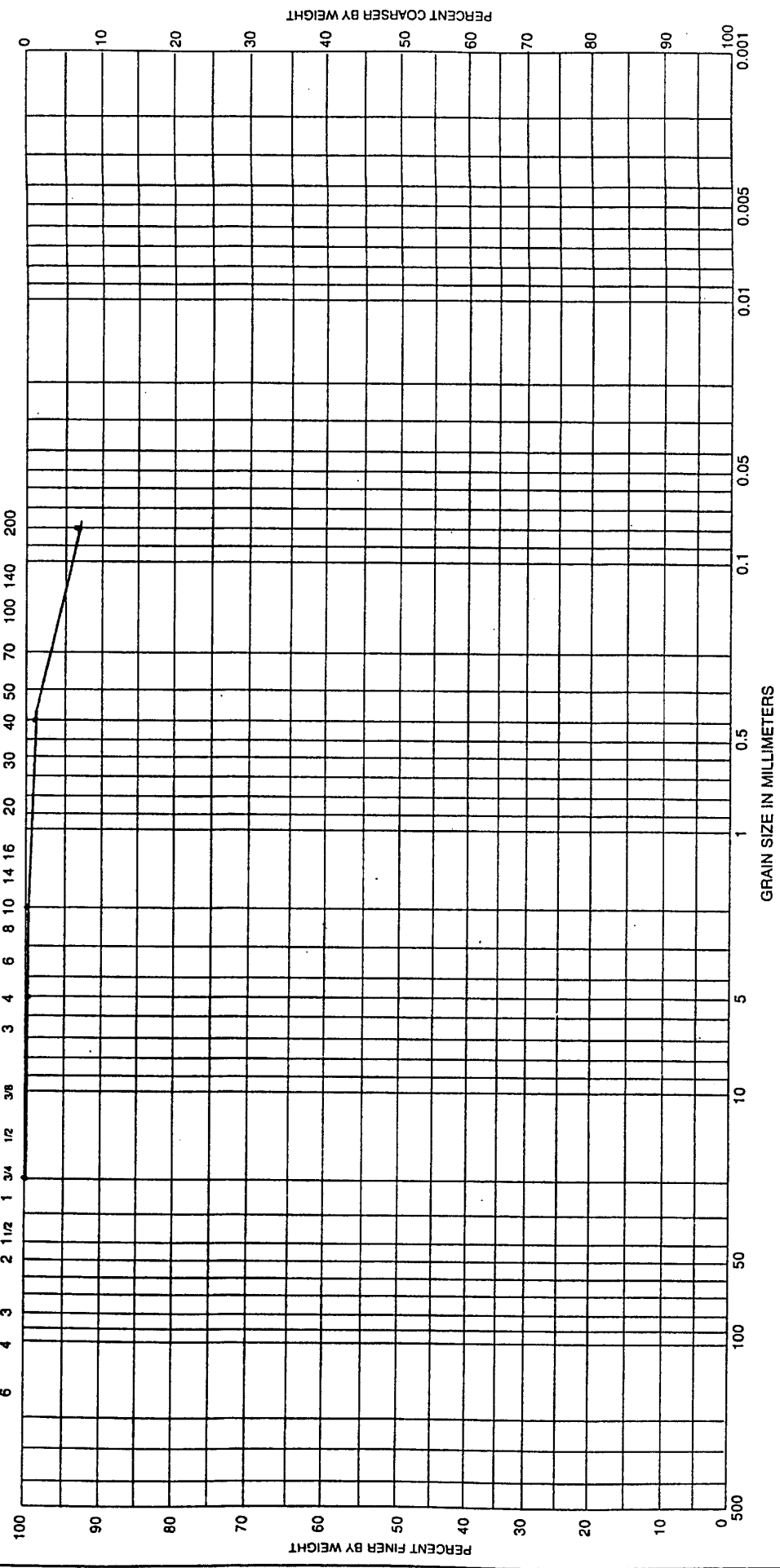
Date 7-12-94

GRADATION CURVES

U.S. STANDARD SIEVE OPENING IN INCHES  
 6 4 3 2 1 1/2 1 3/4 1/2 3/8

U.S. STANDARD SIEVE NUMBERS  
 20 30 40 50 60 70 100 140 200

HYDROMETER



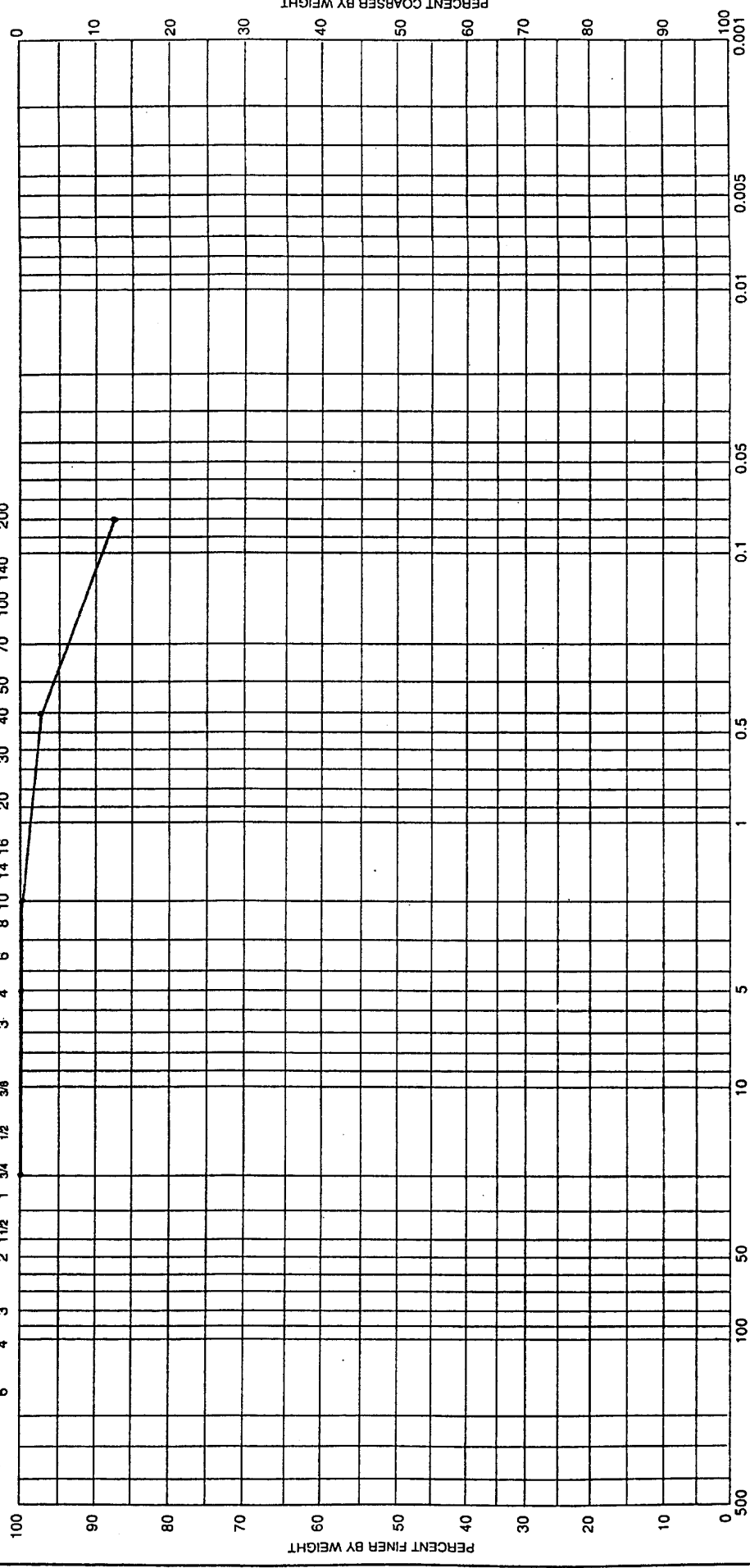
Sample No.	Elev or Depth	Classification	SAND			PI	Project
			Net w %	LL	PL		
TB-2 - 27	135'	Silty Clay: Dark Red Dense (MH)	34	15	19	Amarillo MSW-LF	
						Area	
						Boring No. TB-2	
						Date 7-12-94	

GRADATION CURVES

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



GRAIN SIZE IN MILLIMETERS

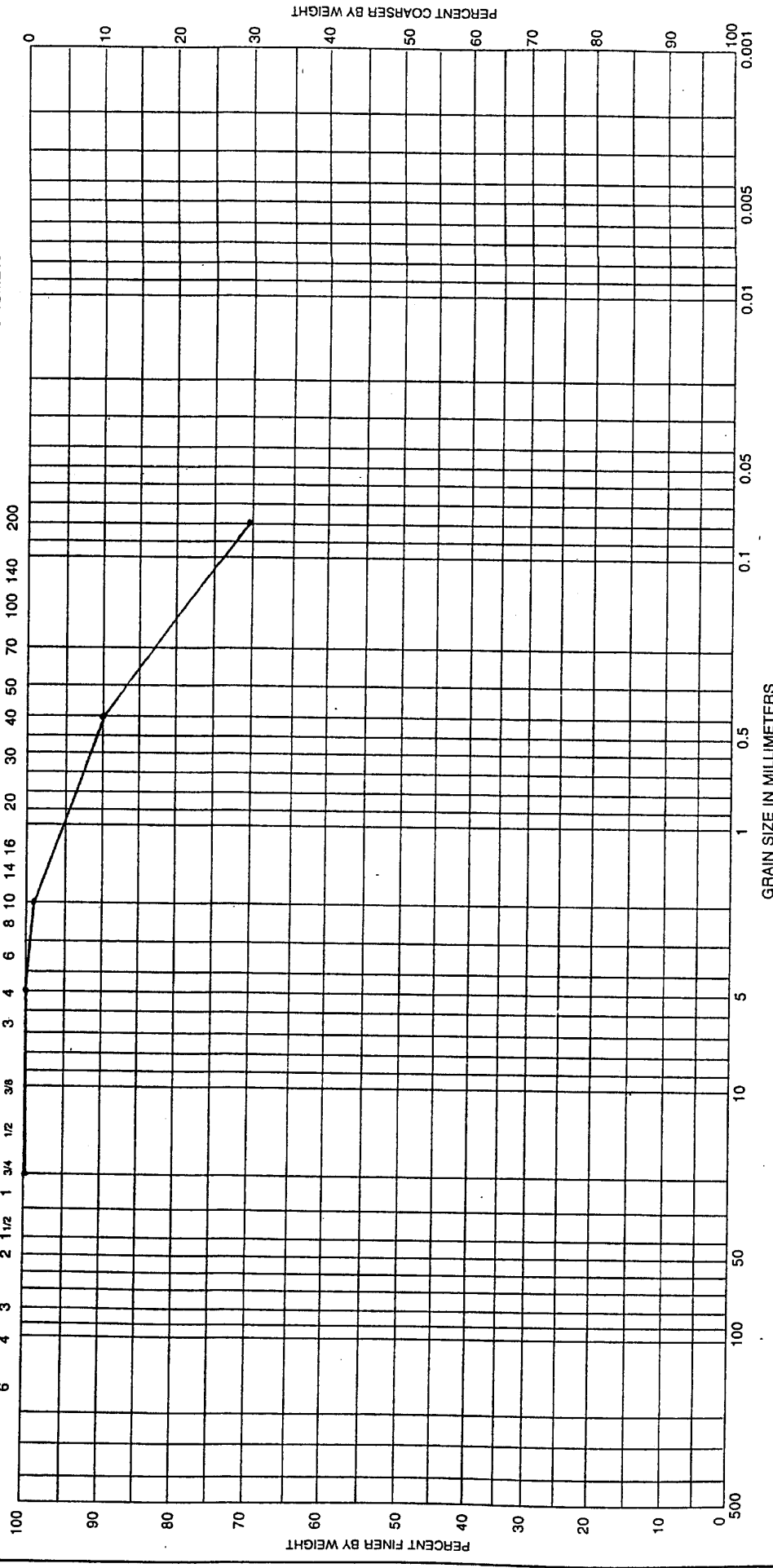
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE	PI	
		Classification	Net w %	LL	PL	

Sample No.	Elev or Depth	Classification	LL	PL	PI	Project
TB-2 - 29	145'	Silty Clay: Dark Red Silty Clay With Brown Silty Stringers Dense (MH)	34	15	19	Amarillo MSW-LF
						Area
						Boring No.
						TB-2
GRADATION CURVES						Date
						7-12-94

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



Sample No.	Elev or Depth	Classification				Net w %	LL	PL	PI
		COARSE	FINE	NEUTRAL	FINE				
TB-2 - 31	155'	Silty Clay: Reddish Brown Dense (MH)					35	16	19

COBBLES  
GRAVEL  
SAND  
SILT OR CLAY

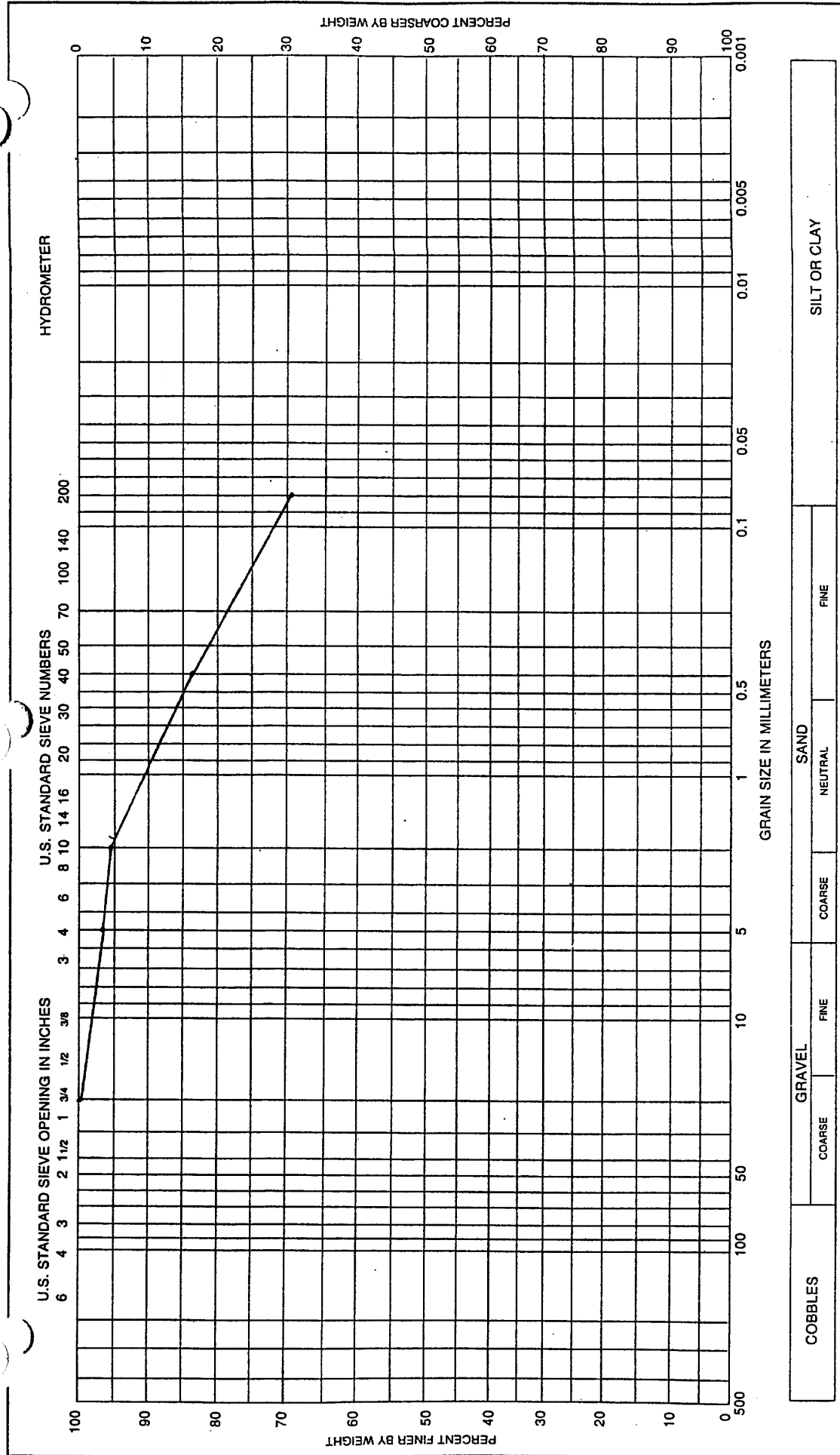
Project: **Amarillo MSW-LF**

Area: \_\_\_\_\_

Boring No.: **TB-2**

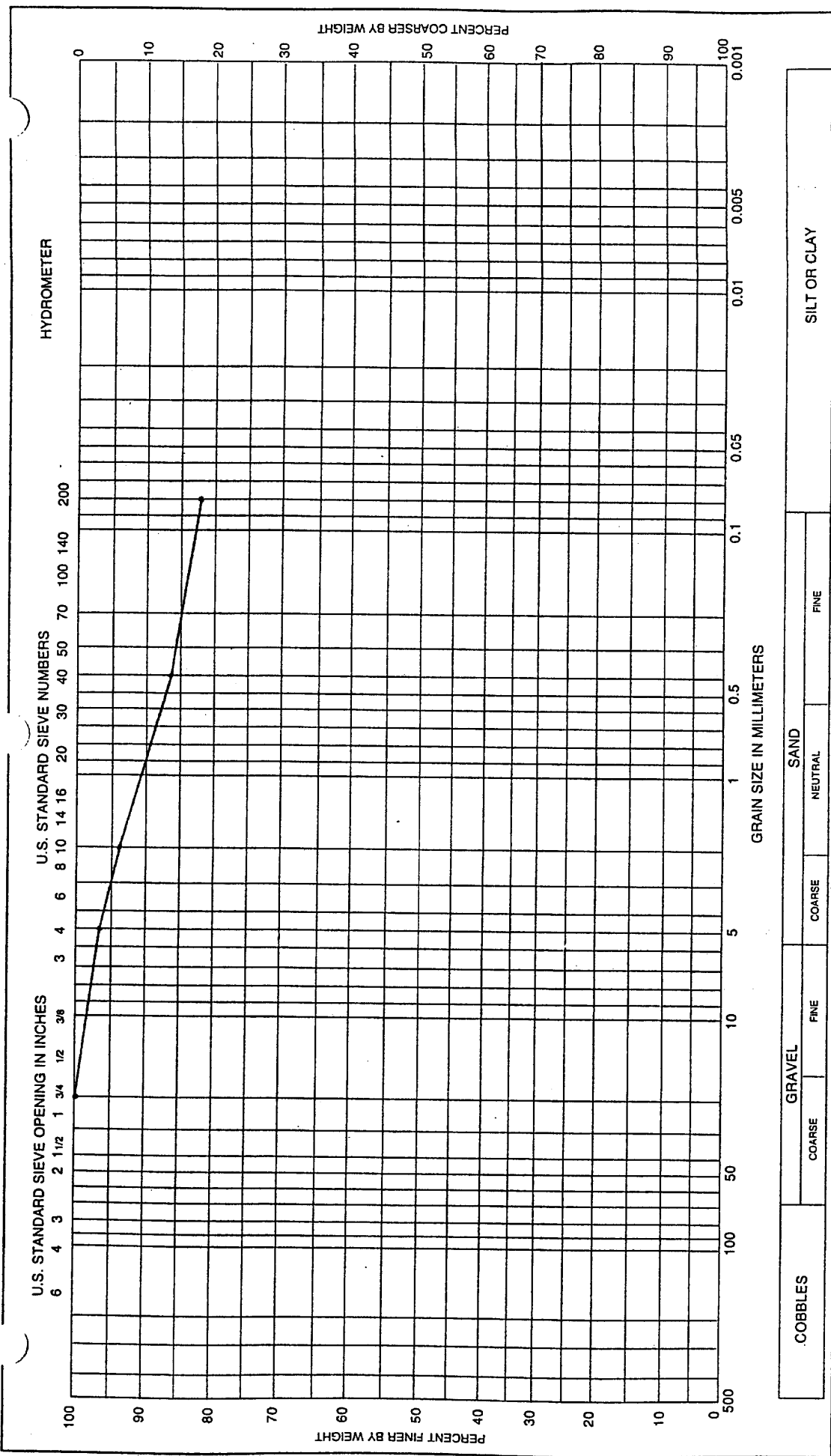
Date: **7-12-94**

GRADATION CURVES

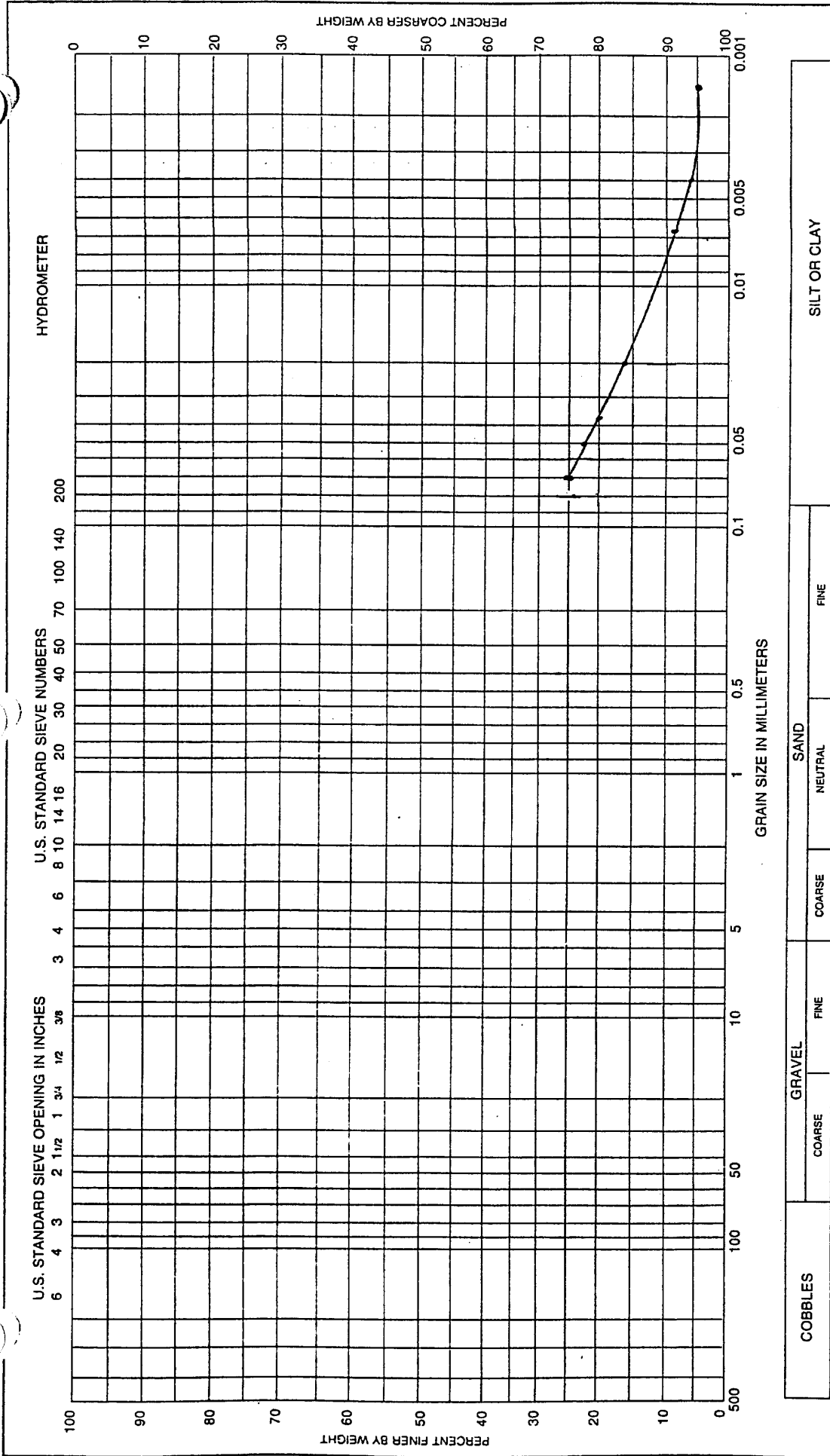


COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	NEUTRAL	NET W %	LL	PL
Sample No.	Elev or Depth	Classification		Net w %		PI	
Tb-2 - 33	165'	Silty Clay: Light Green to Brown, Dense (MH)		39		21	
					Area		
					Boring No.		TB-2
					Date		7-12-94
GRADATION CURVES							

QUEST-PETERSON TESTING LABORATORY, INC.

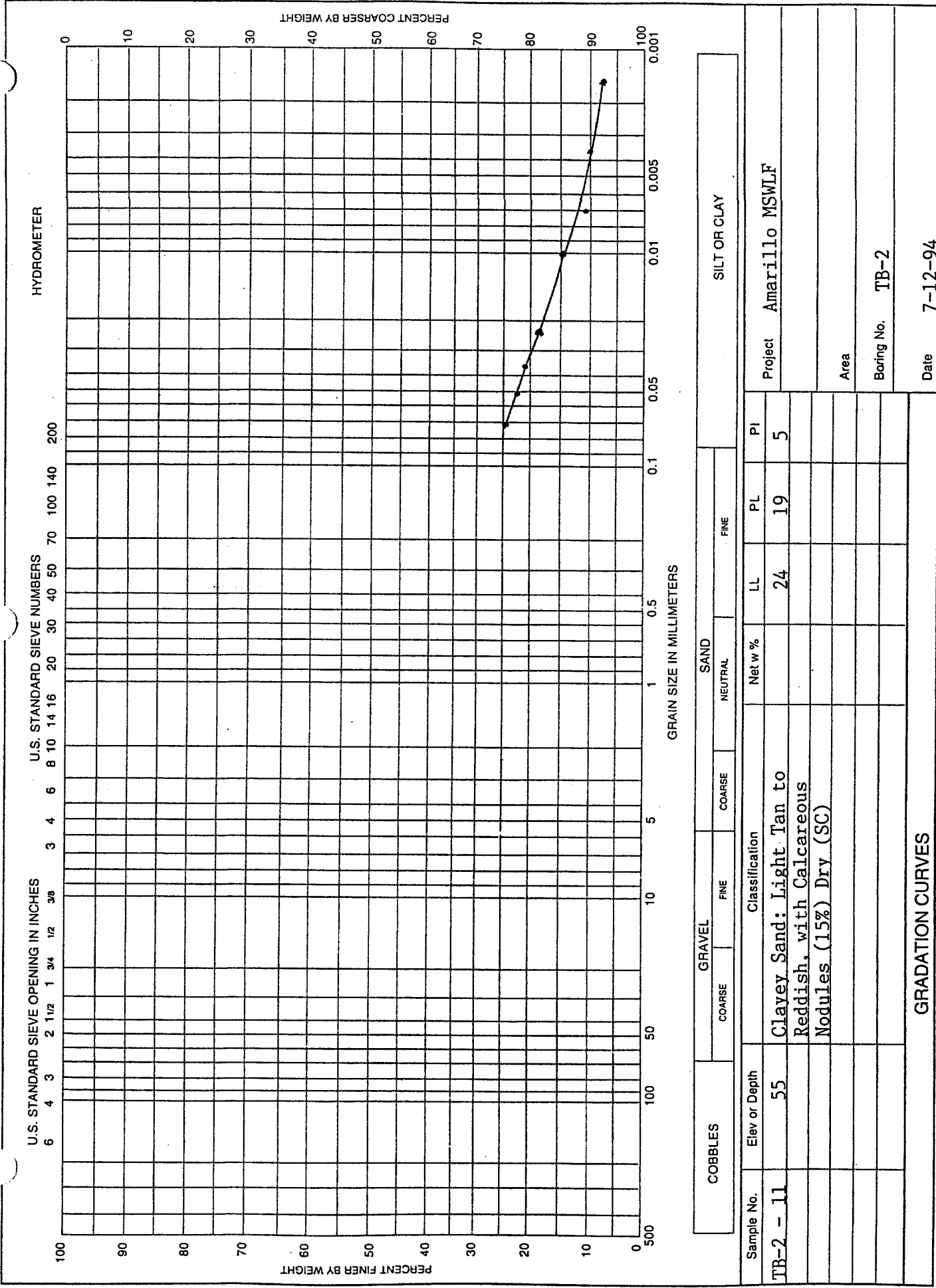


COBBLES		GRAVEL		SAND			SILT OR CLAY		
COARSE		FINE		NEUTRAL			FINE		
Sample No.	Elev or Depth	Classification				Net w %	LL	PL	PI
TB-2 - 36	180'	Silty Clay: Dark Red (Red Bed) Dense (MH)					32	14	18
						Area			
						Boring No.	TB-2		
						Date	7-12-94		
GRADATION CURVES									
Project: Amarillo MSW-LF									



Sample No.	Elev or Depth	Classification	SAND			PI	Project
			Net w %	LL	PL		
TB-2 - 1	5'	Clayey Sand: Tan with Calcareous Nodules, Well Sorted, Dry (SC)		19	17	2	Amarillo MSWLF
							Area
							Boring No. TB-2
							Date 7-12-94

**GRADATION CURVES**



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

PERCENT COARSER BY WEIGHT

PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

Sample No.	Elev or Depth	Classification	SAND			FINE		PI
			Net w %	LL	PL	LL	PL	
TB-2 - 11	55	Clayey Sand: Light Tan to Reddish, with Calcareous Nodules (15%) Dry (SC)		24	19	5		
GRADATION CURVES								

Project Amarillo MSWLF

Area

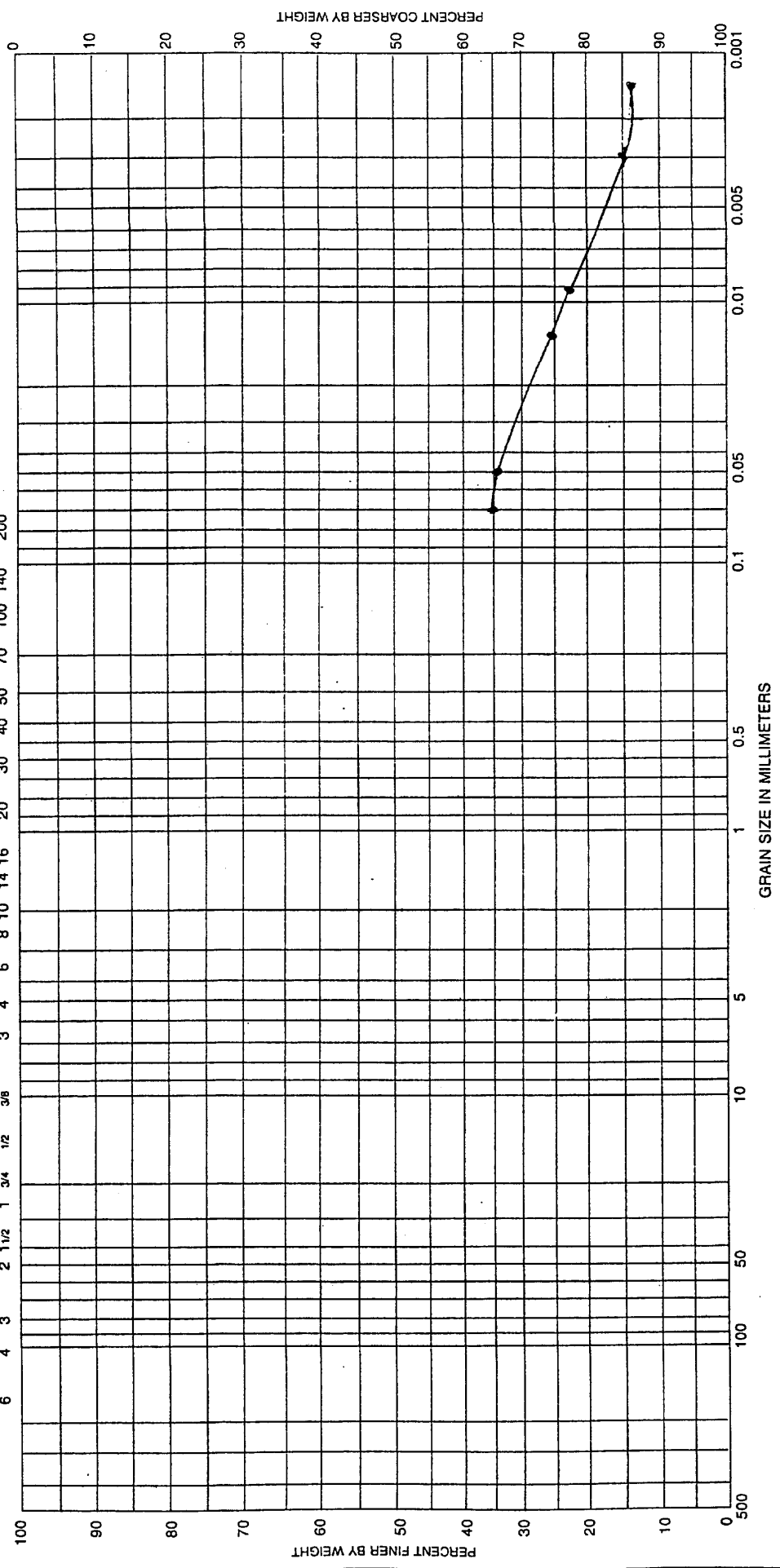
Boring No. TB-2

Date 7-12-94



U.S. STANDARD SIEVE OPENING IN INCHES  
 6 4 3 2 1 1/2 1 3/4 1 1/2 3/8 3 4 6 8 10 14 16 20 30 40 50 70 100 140 200

HYDROMETER



	COBBLES	GRAVEL COARSE   FINE	SAND NEUTRAL   COARSE   FINE	SILT OR CLAY
Sample No.	Elev or Depth	Classification		Project
TB-2 -27	135'	Silty Clay: Dark Red, Dense(MH)		Amarillo MSWLF
		Net w %	LL	PI
			34	19
		PL		
		15		
				Area
				Boring No. TB-2
				Date
				7-12-94
GRADATION CURVES				

**LOG OF BORING**

**MW - 1**

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-1  
 LOCATION: Amarillo, Texas

Date: 8-4-94 thru 8-9-94

Ground Elevation: 3814.85'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air drilled to 125' Groundwater encountered at 225'									
			DESCRIPTION OF STRATUM									
0			Sandy Clay: Dark Brown, Stiff, Dry (CL)			13.1		34	13	21		94.1
5		X	Sandy Clay: Reddish Tan w/Calcareous Nodules (8%) Stiff, Dry (CL)		4-6"	9.9		26	15	11		84.6
					14-12"							
					38-18"							
10		X			7.6"	8.8		29	13	16		90.7
					16-12"							
					27-18"							
15		X			18-6"	10.1		34	13	21		88.9
					41-12"							
					50-13"							
20		X			23-6"	9.9		35	20	15		87.7
					50-12"							
25		X	Sandy Clay: Reddish Tan w/Calcareous Nodules (8%) Stiff, Dry (CL)		15-6"	9.6		26	15	11		92.1
					35-12"							
					50-16"							
30		X	Continued on Page 2									

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-1  
 LOCATION: Amarillo, Texas

Date: 8-4-94 thru 8-9-94

Ground Elevation: 3814.85'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air drilled to 125' Groundwater encountered at 225'									
			DESCRIPTION OF STRATUM									
30	X				16-6"	8.3		32	22	10		80.6
					36-12"							
					50-17"							
35	X				15-6"	9.1		33	24	9		81.4
					33-12"							
					50-15.5"							
40	X				12-6"	8.7		32	20	12		77.9
					30-12"							
					50-17"							
45	X				21-6"	7.1		33	21	12		76.1
					50-11.5"							
50	X				15-6"	8.4		34	23	11		77.8
					36-12"							
					50-15"							
55	X				18-6"	8.7		26	17	9		66.8
					45-12"							
					50-13"							
60	X											

Continued on Page 3

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-1  
 LOCATION: Amarillo, Texas

Date: 8-4-94 thru 8-9-94

Ground Elevation: 3814.85'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air drilled to 125' Groundwater encountered at 225'									
			DESCRIPTION OF STRATUM									
60	/	X										
65	/	X	Sandy Clay: Light Tan, Caliche, Stiff, Dry (CL)									
70	/	X	Caliche: Light Tan, Limestone, Fractures, Hard (CL)									
75	/	X										
80	/	X	Sandy Clay: Light Tan, Caliche (CL)									
85	/	X										
90	/	X	Continued on Page 4									

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-1  
 LOCATION: Amarillo, Texas

Date: 8-4-94 thru 8-9-94

Ground Elevation: 3814.85'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SEVE
			GROUNDWATER INFORMATION: Air drilled to 125' Groundwater encountered at 225'									
			DESCRIPTION OF STRATUM									
90	○	X										
			50-7"									
95	○	X										
			50-8.5"									
100	○	X										
105	○	X										
110	○	X	Clayey Sand: Reddish Tan, w/Calcareous Nodules (10%) Stiff, Dry (SC)									
			50-12"									
115	○	X										
120	○	X										

Continued on Page 5

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-1  
 LOCATION: Amarillo, Texas

Date: 8-4-94 thru 8-9-94

Ground Elevation: 3814.85'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary										
			GROUNDWATER INFORMATION: Air drilled to 125' Groundwater encountered at 225'										
			DESCRIPTION OF STRATUM										
			SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE			
120	▽		24.6"	1.7		16	12	4			14.9		
	○		50-10"										
125	○												
130	X		50-4"										
135			Lost Circulation Not Able to Sample from 130' to 190'										
140													
145													
150													

Continued on Page 6

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-1  
 LOCATION: Amarillo, Texas

Date: 8-4-94 thru 8-9-94

Ground Elevation: 3814.85'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 125' Groundwater encountered at 225'								
			DESCRIPTION OF STRATUM								
150											
155											
160											
165											
170											
175											
180											

Continued on Page 7




# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-1  
 LOCATION: Amarillo, Texas

Date: 8-4-94 thru 8-9-94

Ground Elevation: 3814.85'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air drilled to 125' Groundwater encountered at 225'								
180											
185											
190											
195			Regained Circulation								
200		X	Clayey Sand: Reddish Tan, w/Calcareous Nodules (10%) Stiff, Dry (SC)	50-5"	MD		20	16	4		14.1
205			Lost Circulation Not Able to Sample from 205' to 253'								
210			Continued on Page 8								

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-1  
 LOCATION: Amarillo, Texas

Date: 8-4-94 thru 8-9-94

Ground Elevation: 3814.85'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air drilled to 125' Groundwater encountered at 225'								
210											
215											
220											
225											
230											
235											
240											

Continued on Page 9

## LOG OF BORING

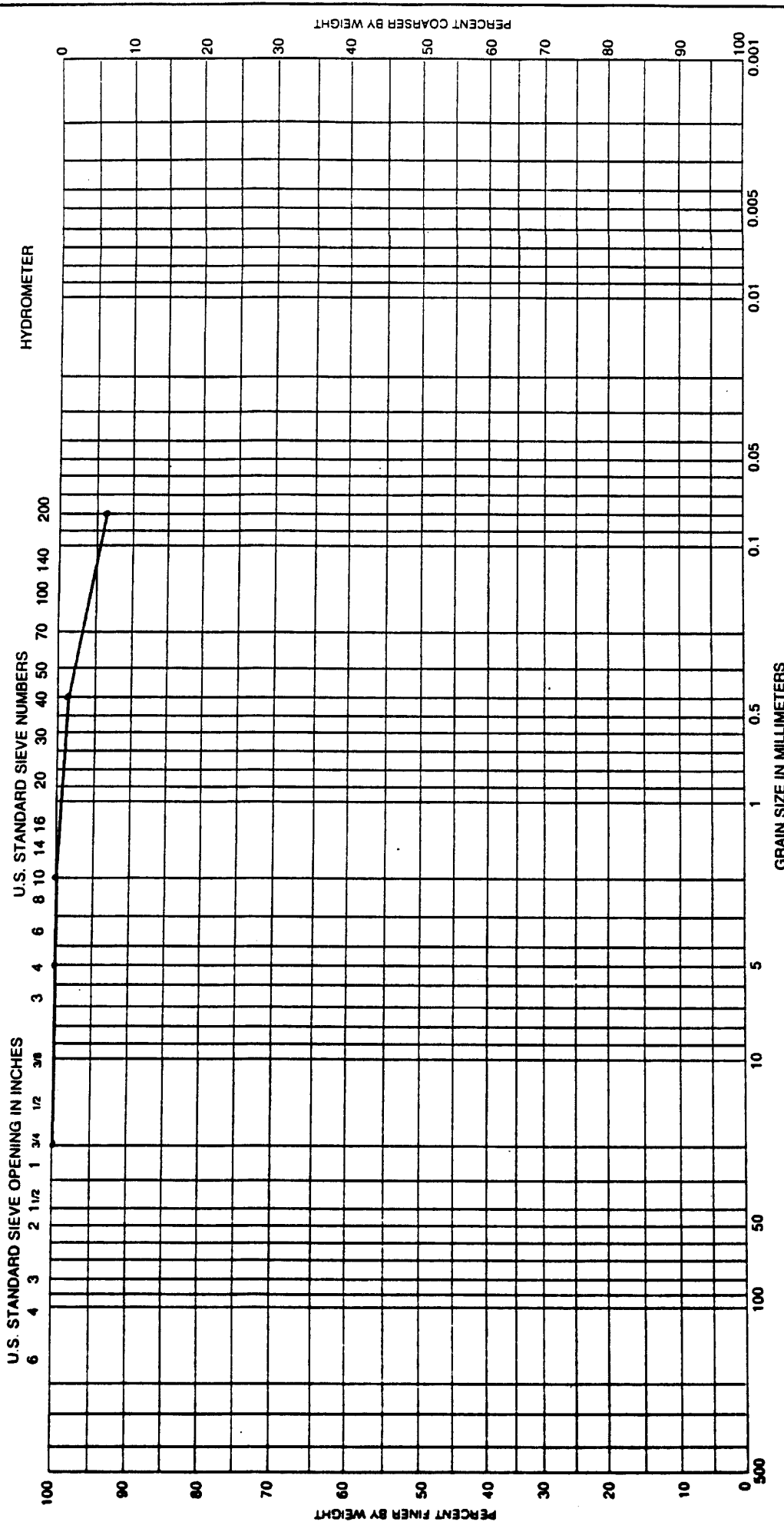
PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-1  
 LOCATION: Amarillo, Texas

Date: 8-4-94 thru 8-9-94

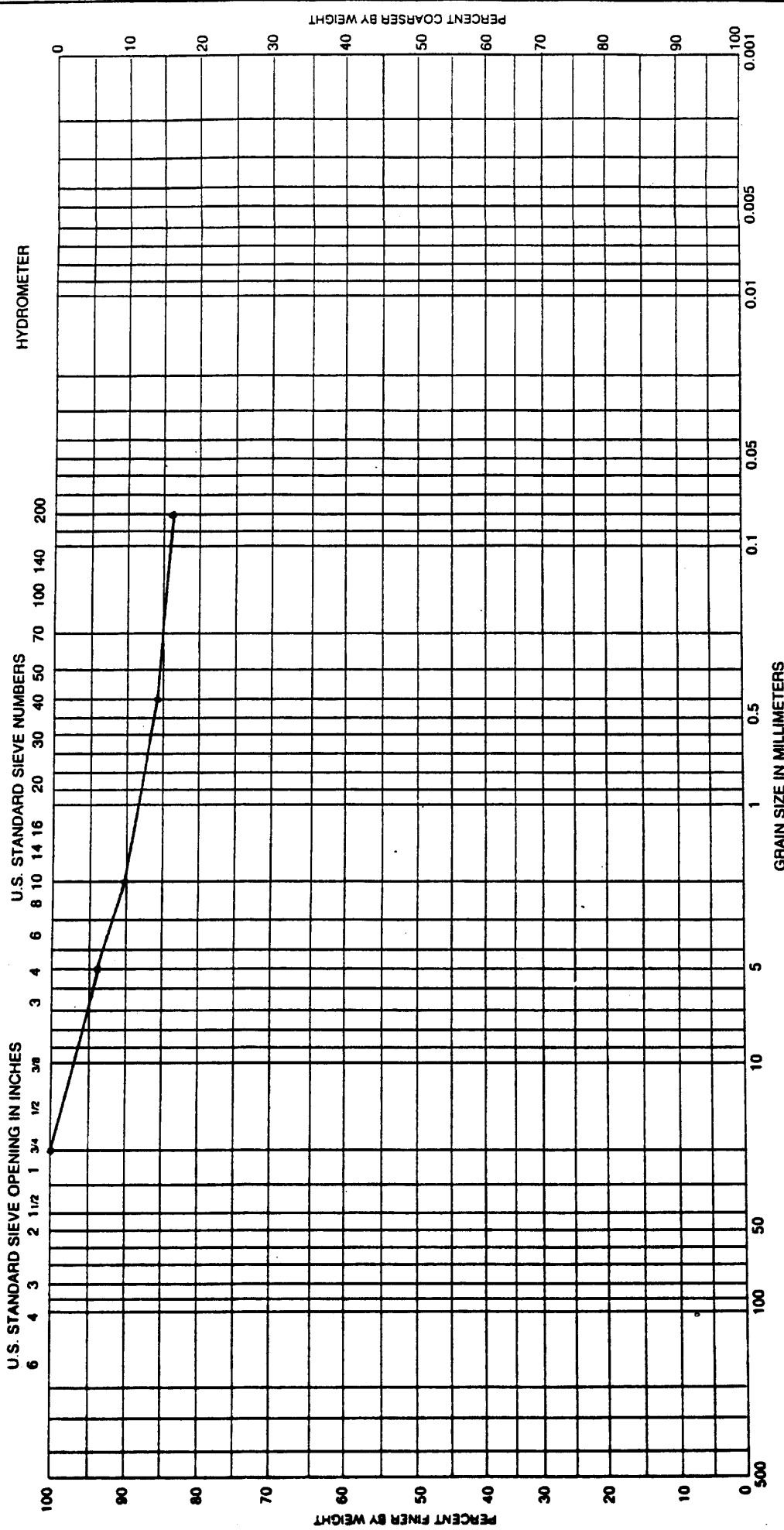
Ground Elevation: 3814.85'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air drilled to 125' Groundwater encountered at 225'								
			DESCRIPTION OF STRATUM								
240'											
245											
250											
255			* T.D. - 253' *								

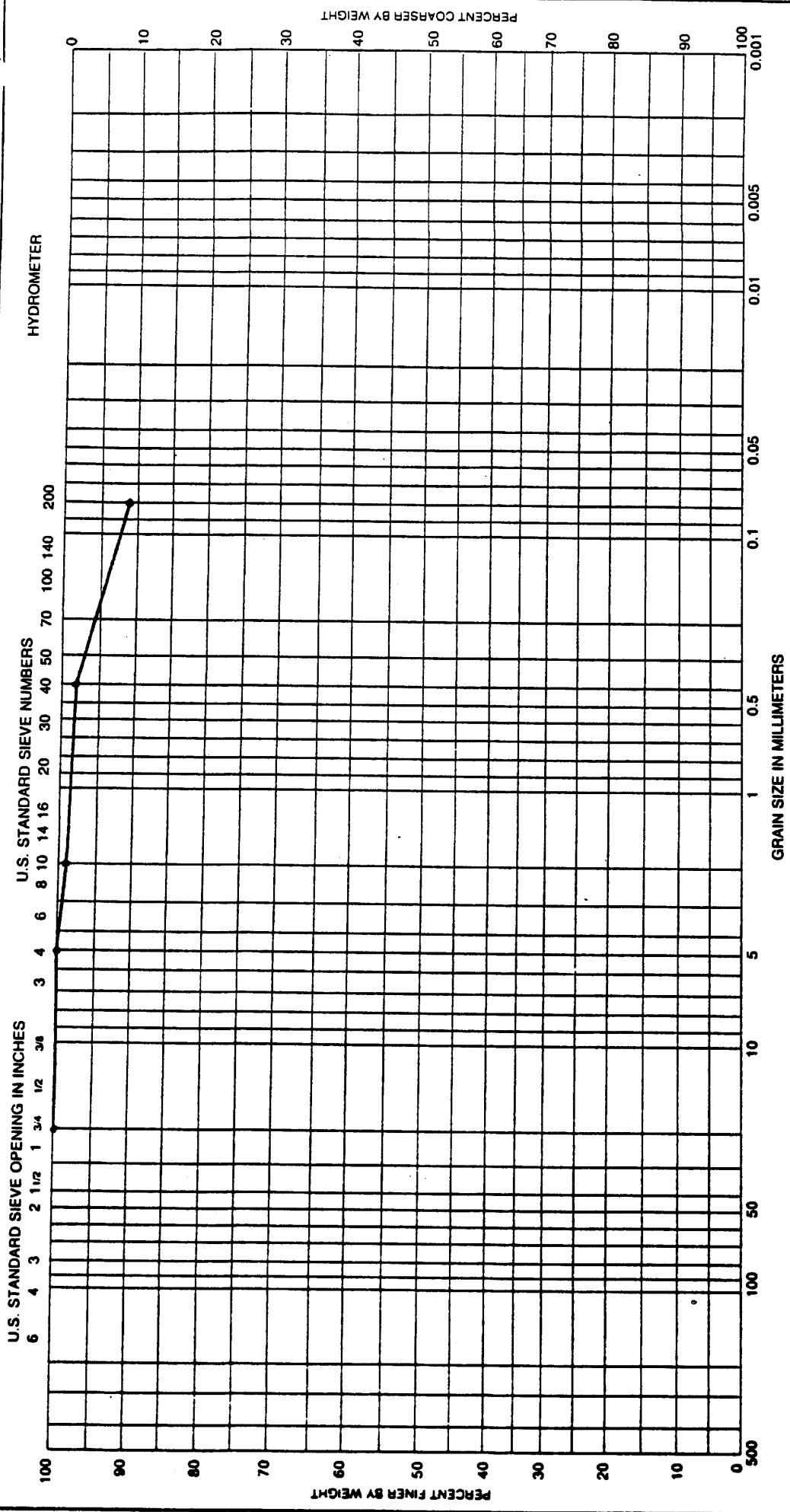


COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	NEUTRAL	FINE		
Sample No.	Elev or Depth	Classification				LL	PI
MW-1 - 1	0 - 2'	Sandy Clay: Dark Brown, Stiff Dry (CL)				34	21
						Net w %	
						PL	
						Area	
						Boring No.	MW-1
						Project	Amarillo MSW-LF
						Date	8-4-94

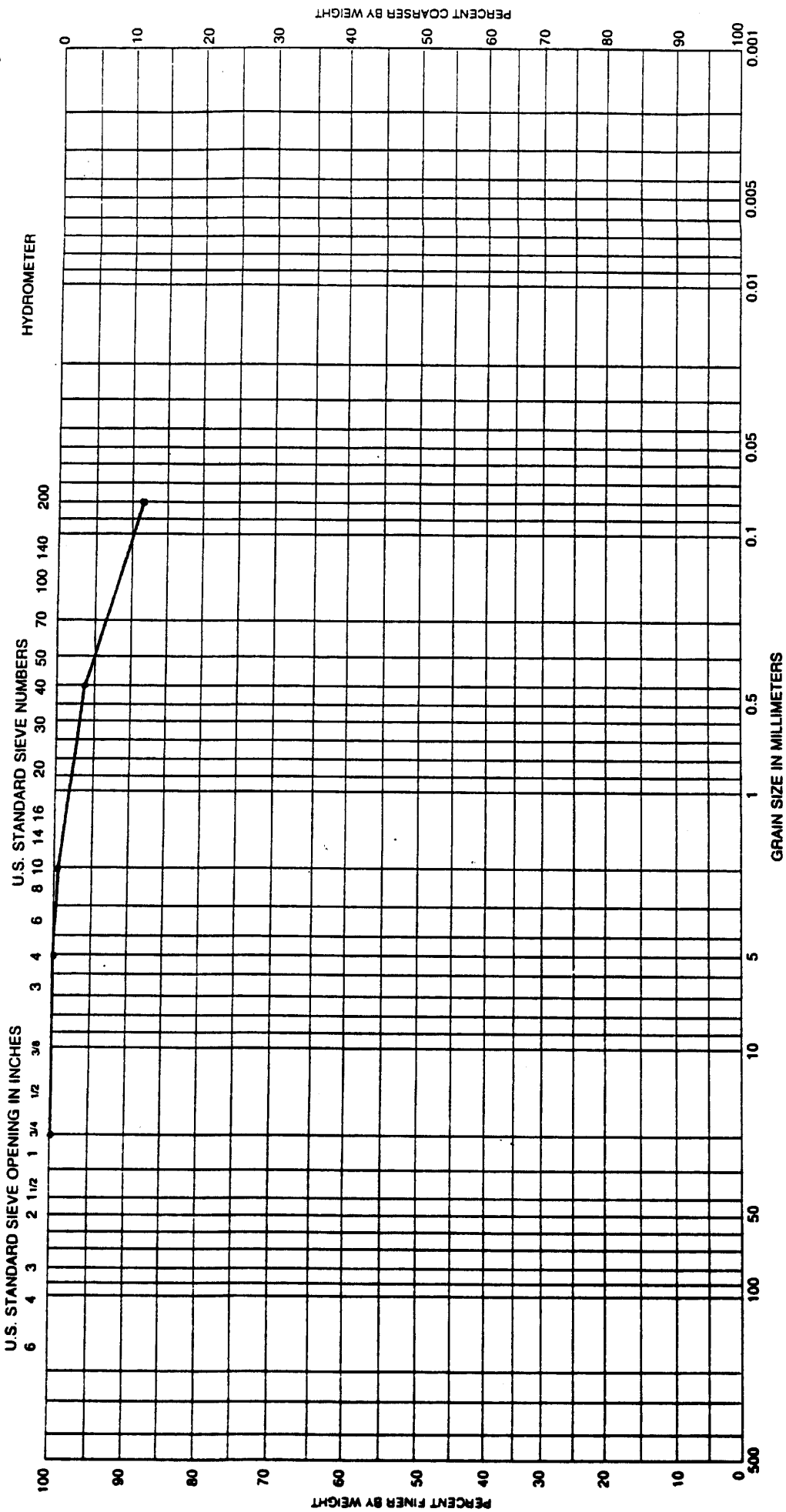
**GRADATION CURVES**



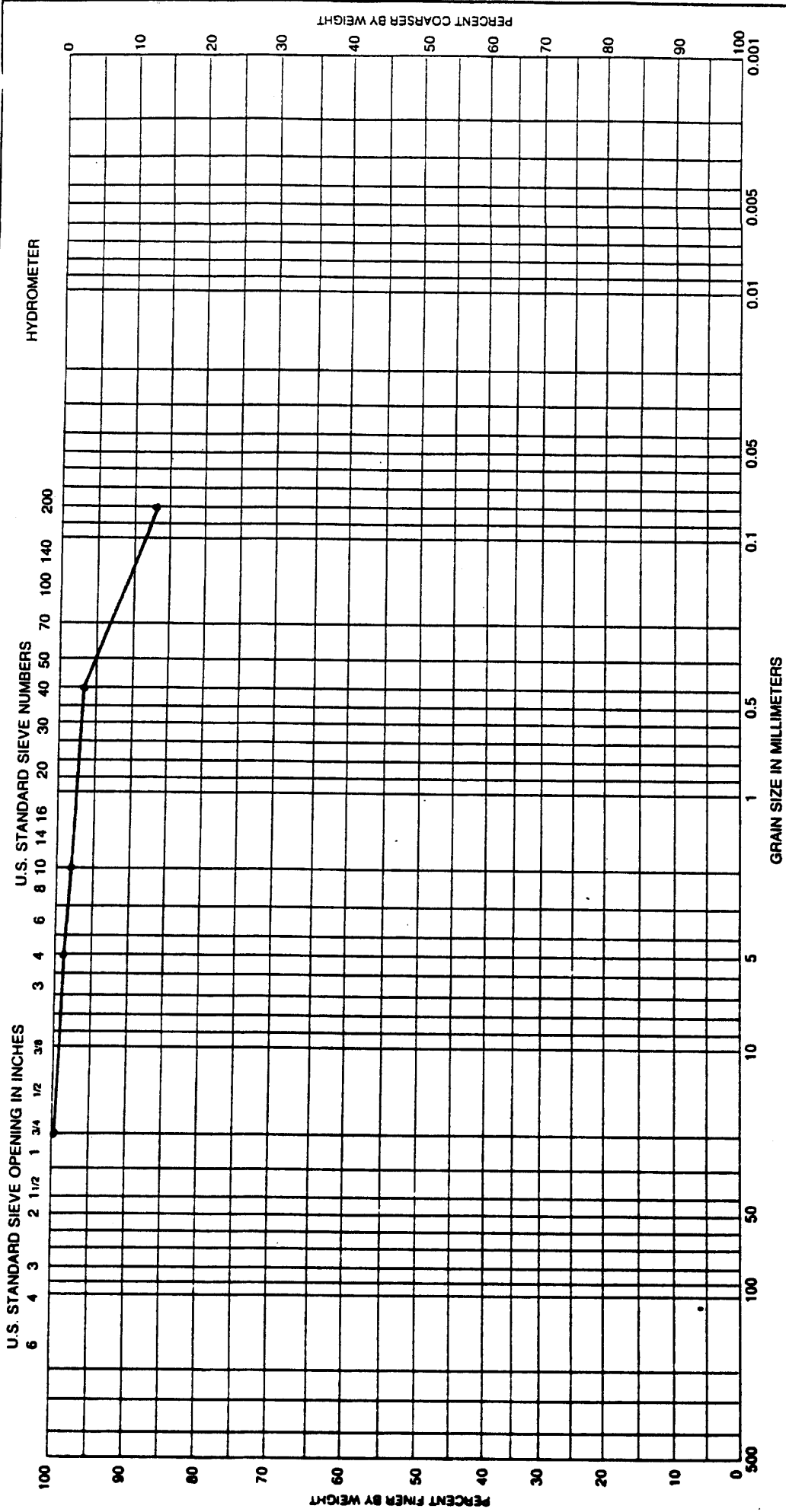
COBBLES		GRAVEL		SAND		SILT OR CLAY	
COARSE		FINE		NEUTRAL		FINE	
Sample No.	Elev or Depth	Classification				PI	Project
MW-1-2	5'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff, Dry (CL)				11	Amarillo MSWLF
		Net w %	LL	PL		Area	
			26	15		Boring No.	MW-1
						Date	8-4-94
<b>GRADATION CURVES</b>							



Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-1 - 3	10'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff, Dry (CL)	29	13	16	
GRADATION CURVES						
Project		Amarillo MSW-LF				
Area						
Boring No.		MW-1				
Date		8-4-94				



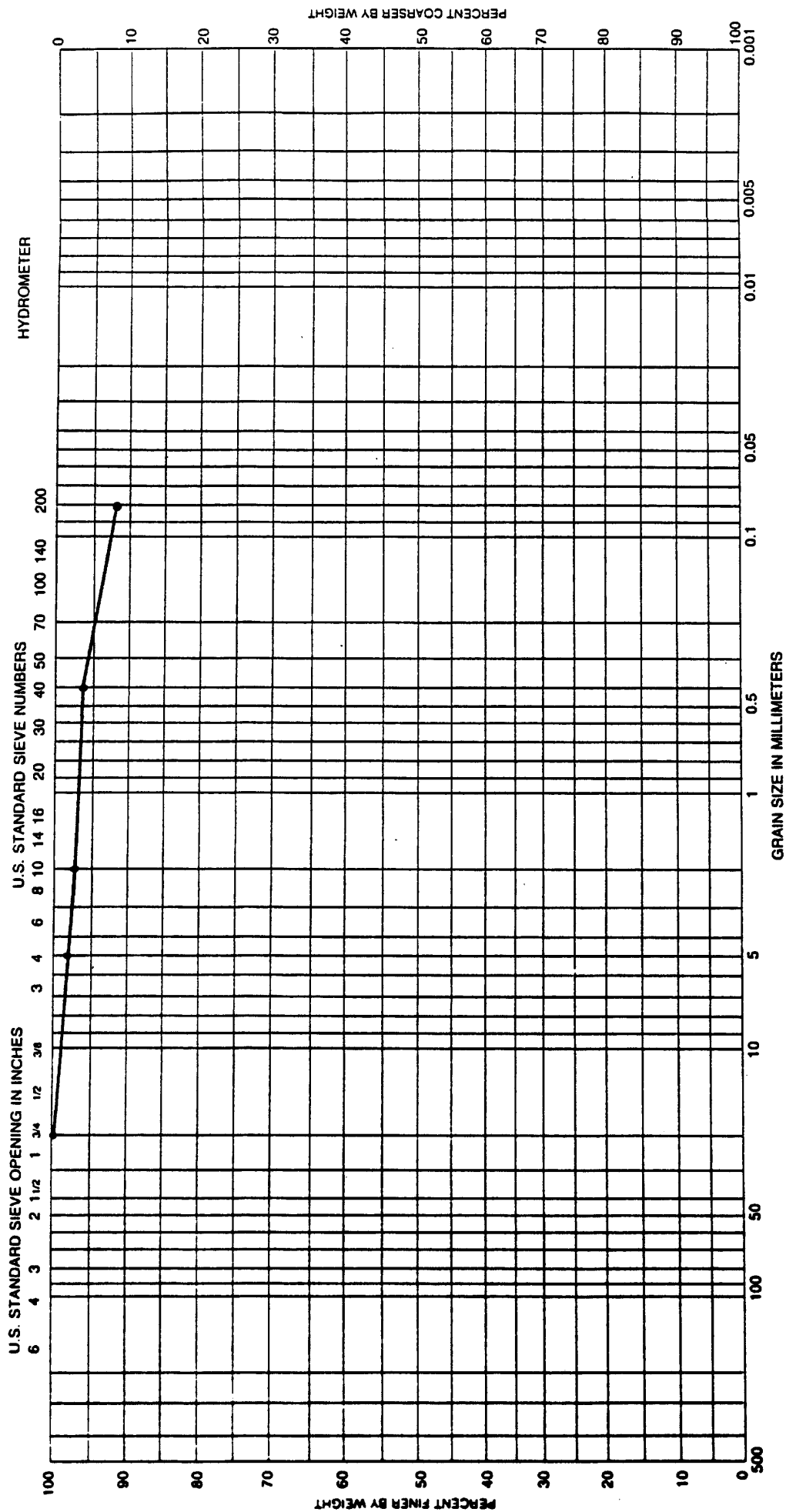
COBBLES		GRAVEL		SAND			SILT OR CLAY		
		COARSE	FINE	COARSE	NEUTRAL	FINE			
Sample No.	Elev or Depth	Classification					PI	Project	
MW-1 - 4	15'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff, Dry (CL)					34	21	Amarillo MSW-LF
							LL	PL	
							Net w %		Area
									Boring No. MW-1
									Date 8-4-94
<b>GRADATION CURVES</b>									



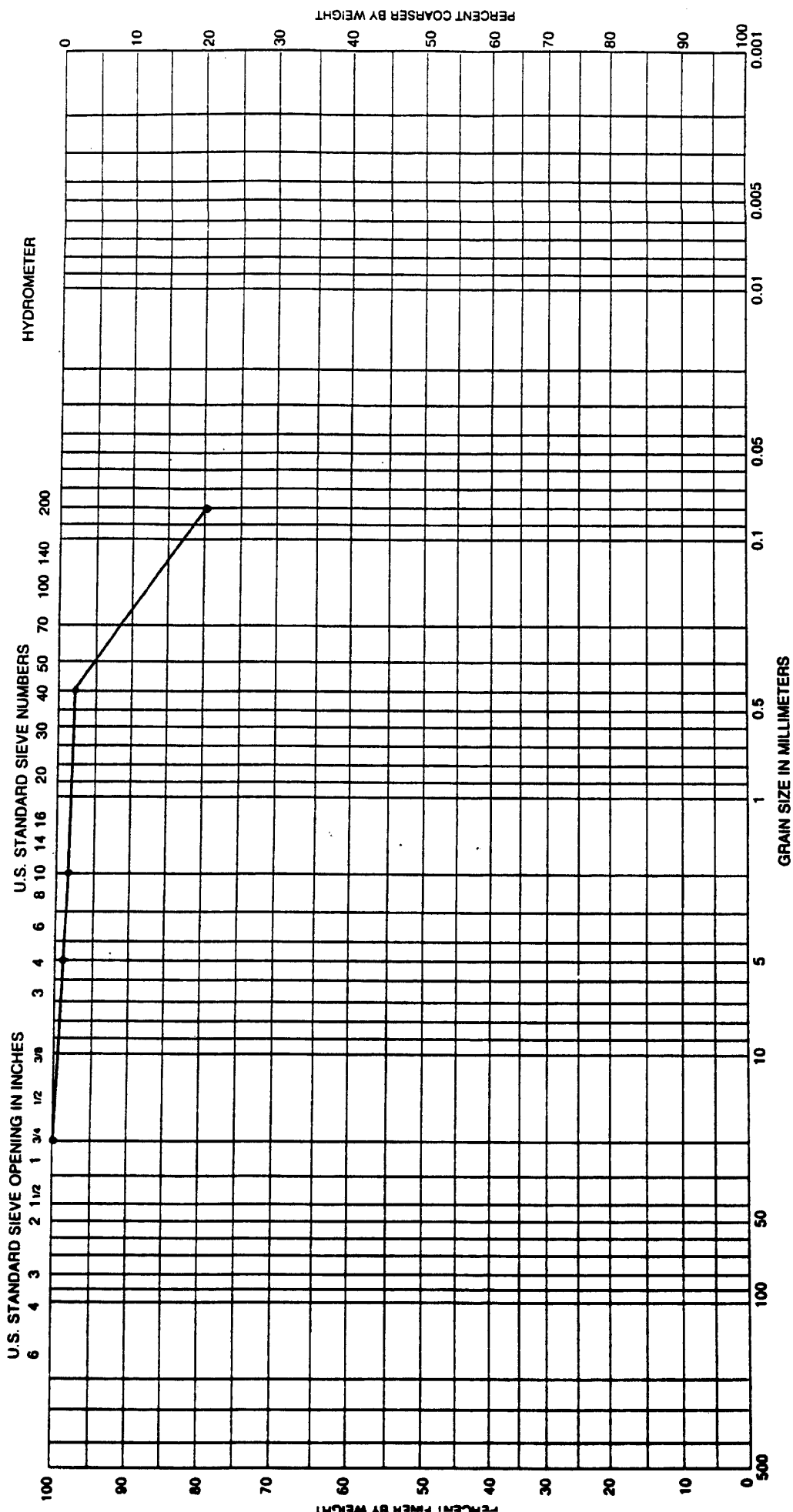
COBBLES		GRAVEL		SAND			SILT OR CLAY			
		COARSE	FINE	COARSE	NEUTRAL	FINE				
Sample No.	Elev or Depth	Classification					PI	Project		
MW-1 - 5	20'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff, Dry (CL)					15	Amarillo MSW-LF		
							LL	Area		
							35	Boring No.		
								MW-1		
								Date		
								8-4-94		

GRADATION CURVES



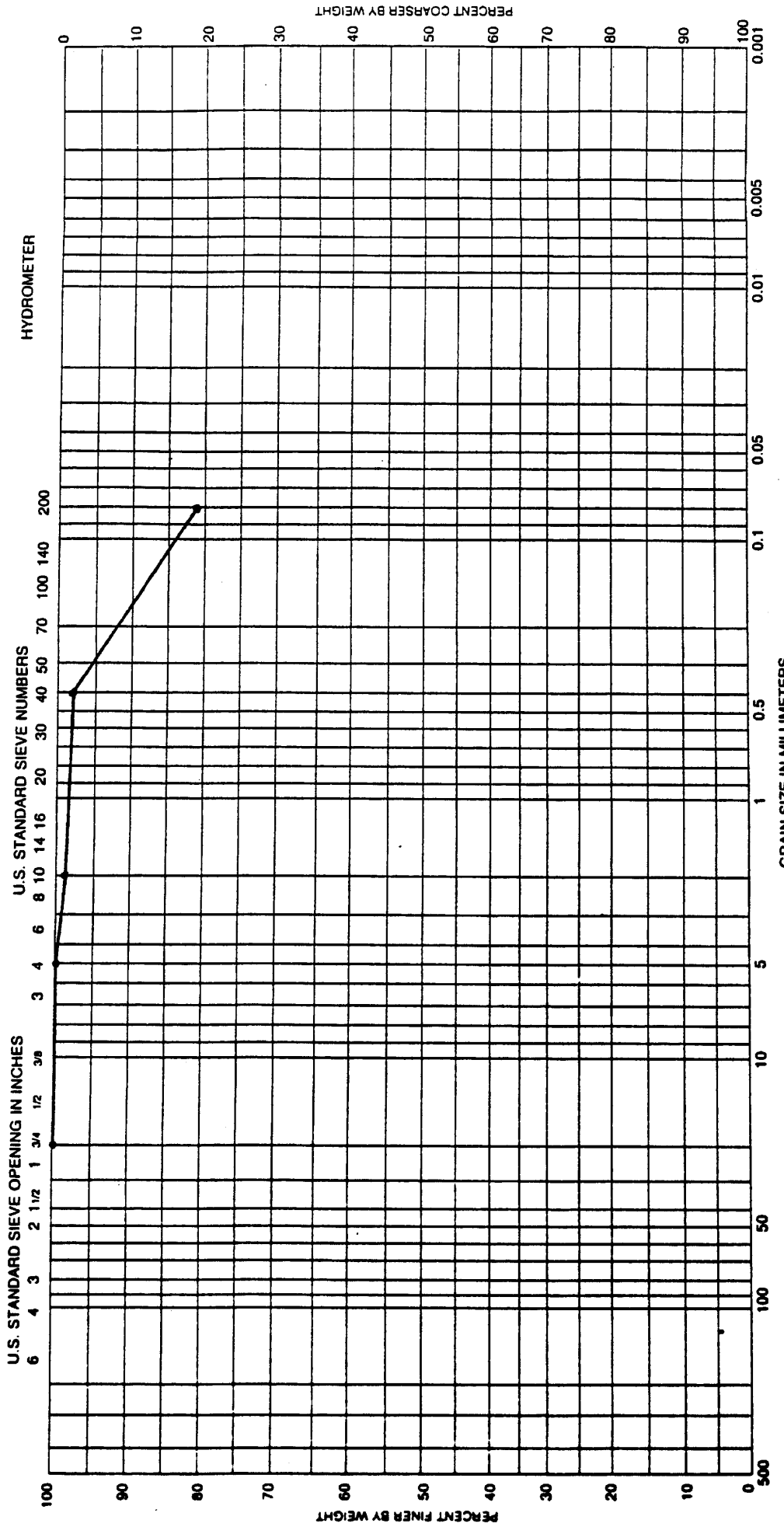


COBBLES		GRAVEL		SAND			SILT OR CLAY		
		COARSE	FINE	COARSE	NEUTRAL	FINE			
Sample No.	Elev or Depth	Classification					PI	Project	
MW-1 - 6	25'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff, Dry (CL)					26	15	Amarillo MSW-LF
							LL		Area
							PL		Boring No.
							PI		MW-1
							Net w %		Date
									8-4-94
<b>GRADATION CURVES</b>									



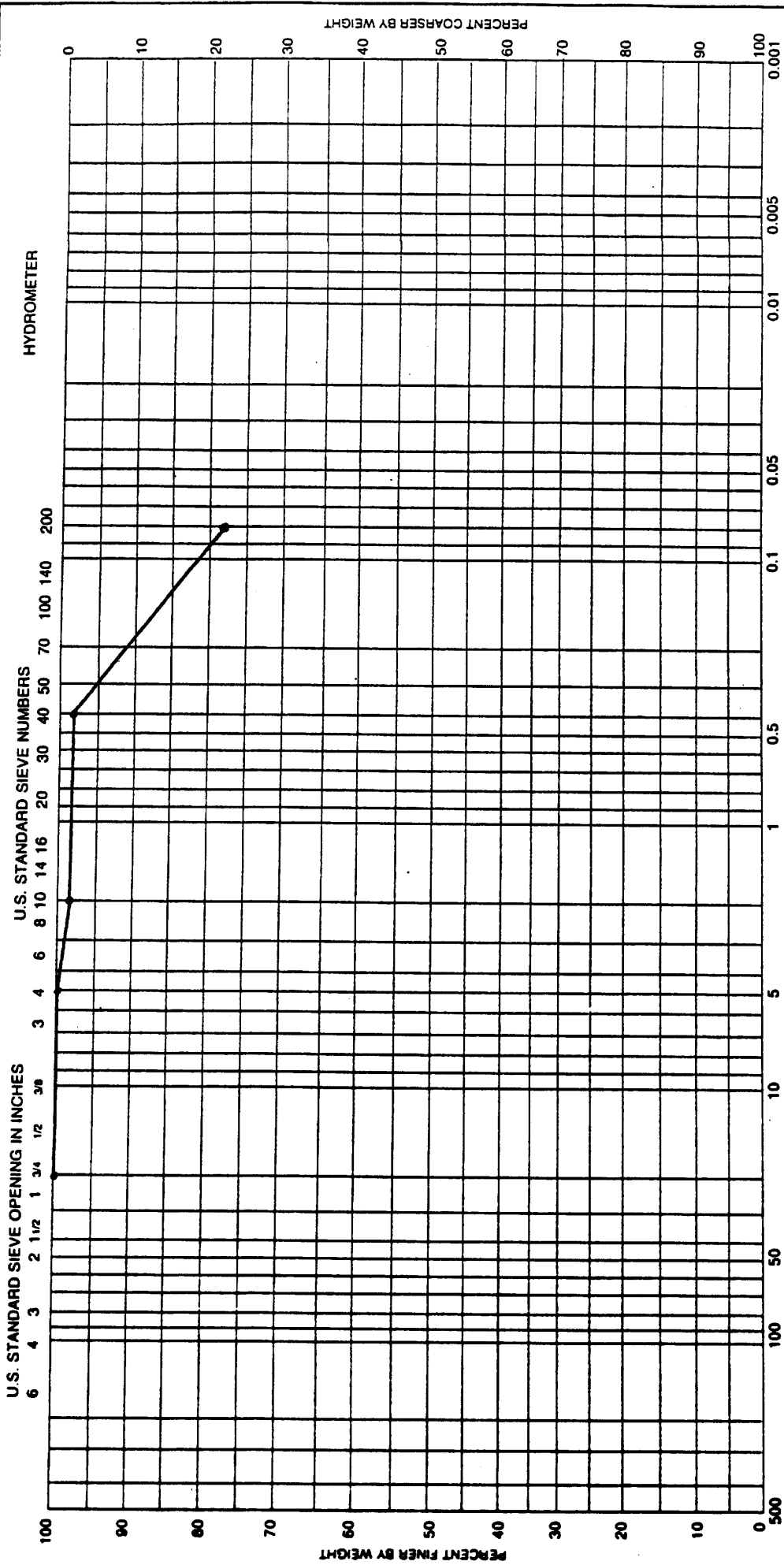
Sample No.	Elev or Depth	Classification	SAND			SILT OR CLAY			
			Net w %	LL	PL	PI	Project	Area	Boring No.
MW-1-7	30'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff, Dry (CL)	32	22	10	Amarillo	MSWLF	MW-1	8-4-94

GRADATION CURVES



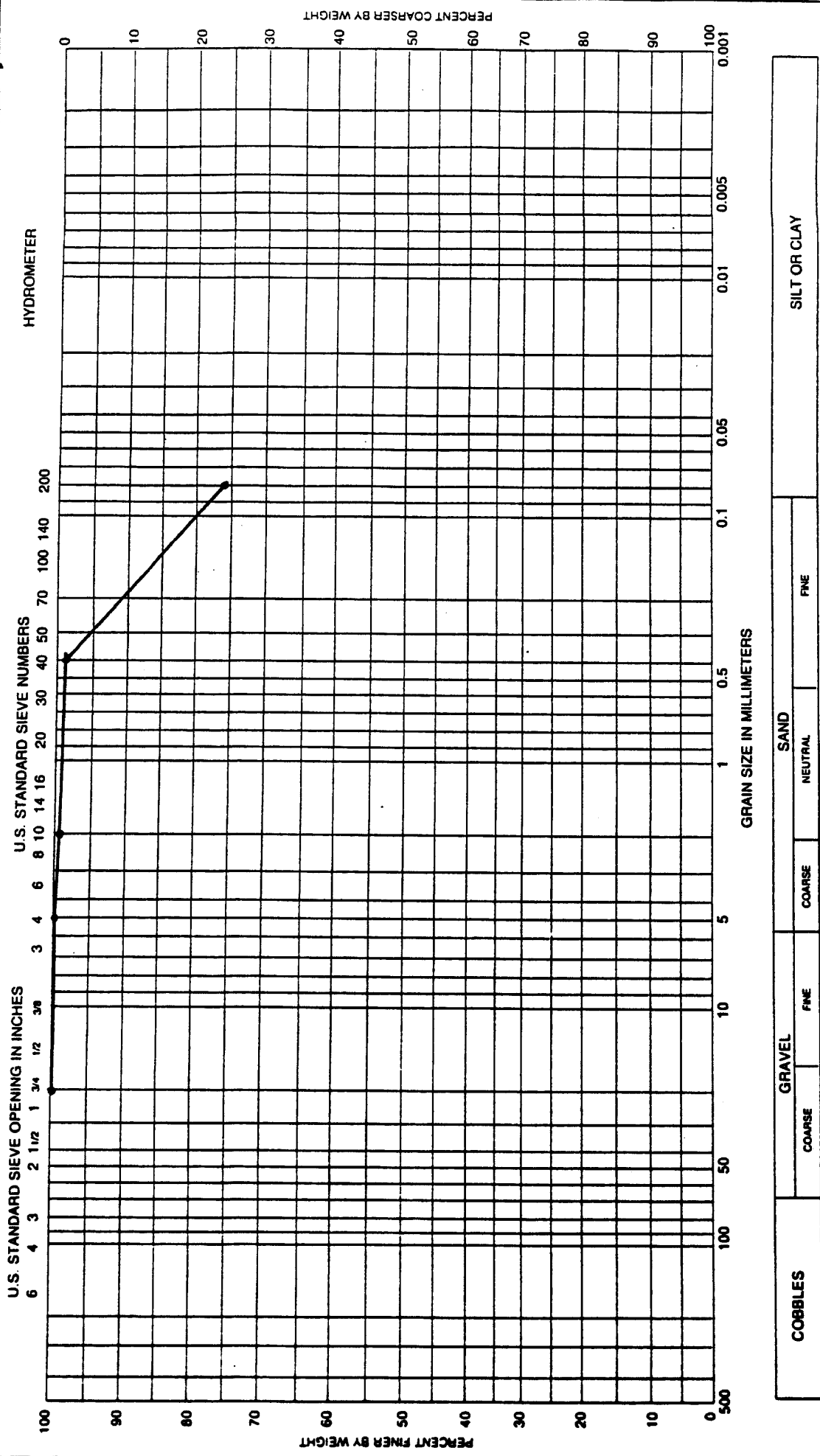
Sample No. <b>MW-1 - 8</b>	Elev or Depth <b>35'</b>	Classification <b>Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff, Dry (CL)</b>	Net w %	LL	PL	PI
			33	24	9	
Project <b>Amarillo MSW-LF</b>						
Area						
Boring No. <b>MW-1</b>						
Date <b>8-4-94</b>						

**GRADATION CURVES**



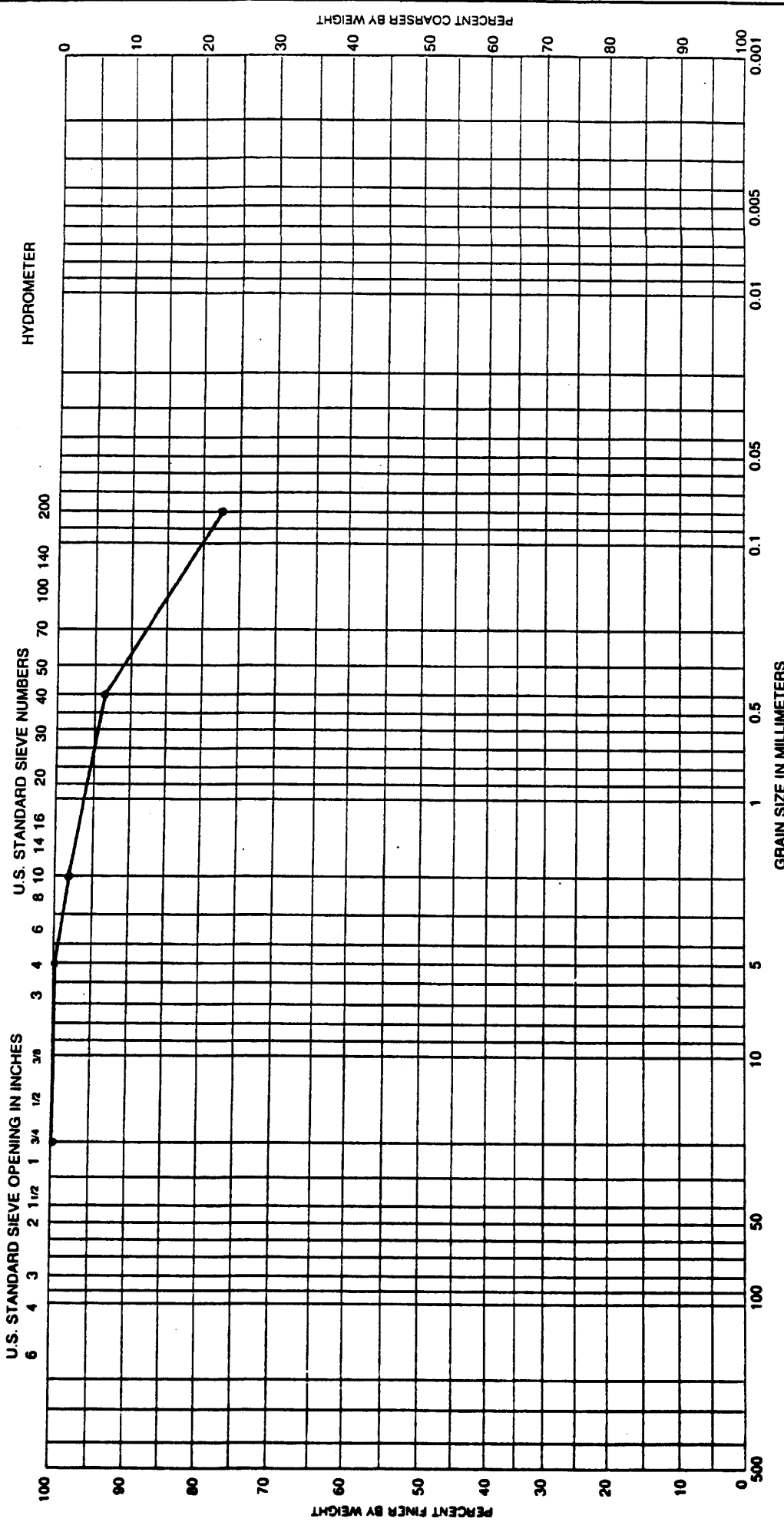
COBBLES		GRAVEL		SAND		SILT OR CLAY		
		COARSE	FINE	NEUTRAL	FINE			
Sample No.	Elev or Depth	Classification				LL	PL	PI
MW-1 - 9	40'	Sandy Clay; Reddish Tan With Calcareous Nodules (8%) Stiff, Dry (CL)				32	20	12
Project		Amarillo		MSW-LF				
Area								
Boring No.		MW-1						
Date		8-4-94						

**GRADATION CURVES**



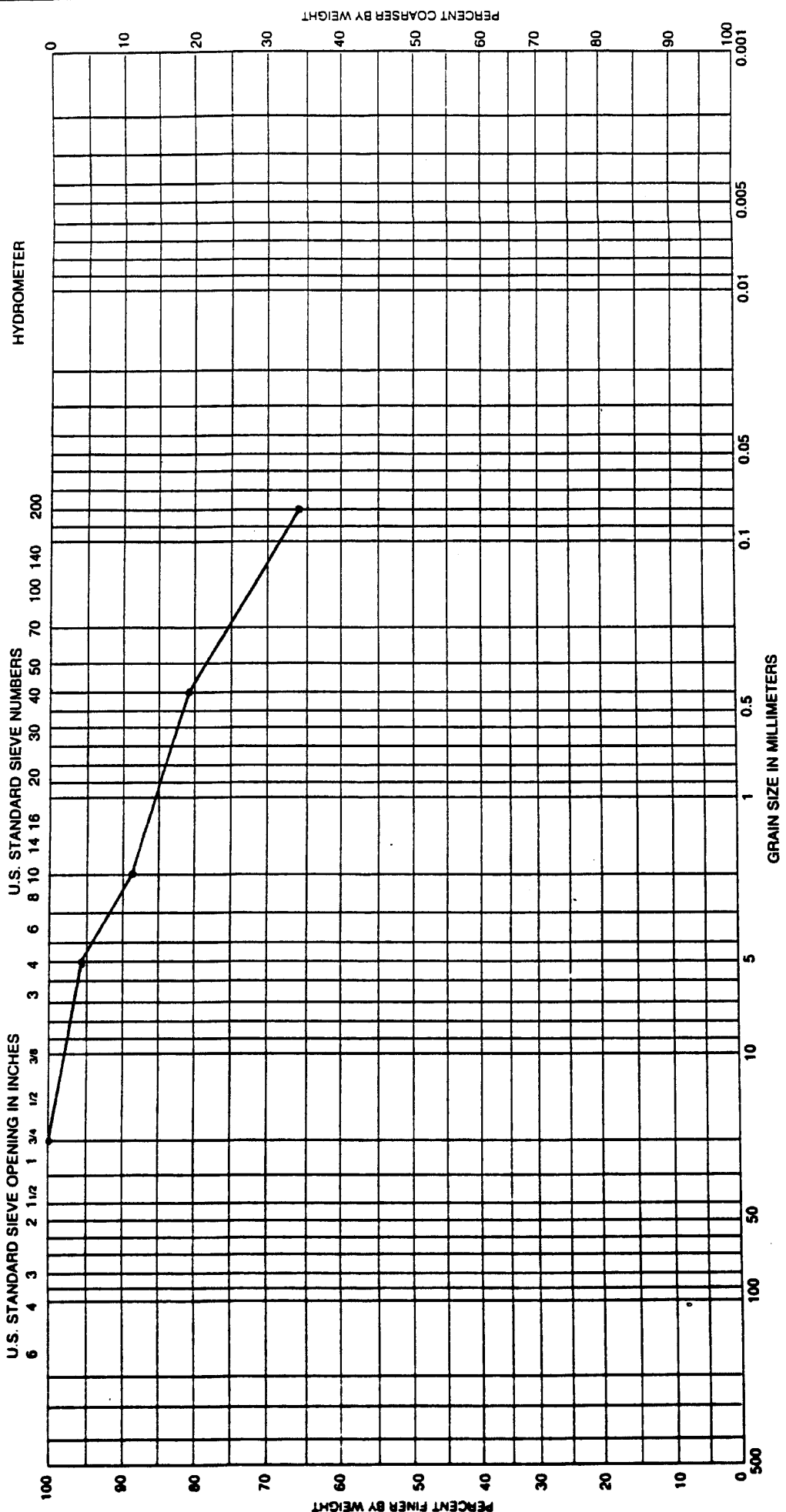
COBBLES		GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	COARSE	NEUTRAL	FINE			
Sample No.	Classification			Net w %	LL	PL	PI	Project
MW-1 - 10	Sandy Clay; Reddish Tan With Calcareous Nodules (8%) Stiff, Dry (CL)			33	21	12	Amarillo MSW-LF	Area
Elev or Depth								Boring No.
45'								MW-1
								Date
								8-4-94

**GRADATION CURVES**



Sample No.	Elev or Depth	Classification				SOIL OR CLAY			
		COARSE	FINE	NEUTRAL	NET W %	LL	PL	PI	Project
MM-1 - 11	50'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff, Dry (CL)				34	23	11	Amarillo MSW-LF
									Area
									Boring No. MW-1
									Date 8-4-94

GRADATION CURVES

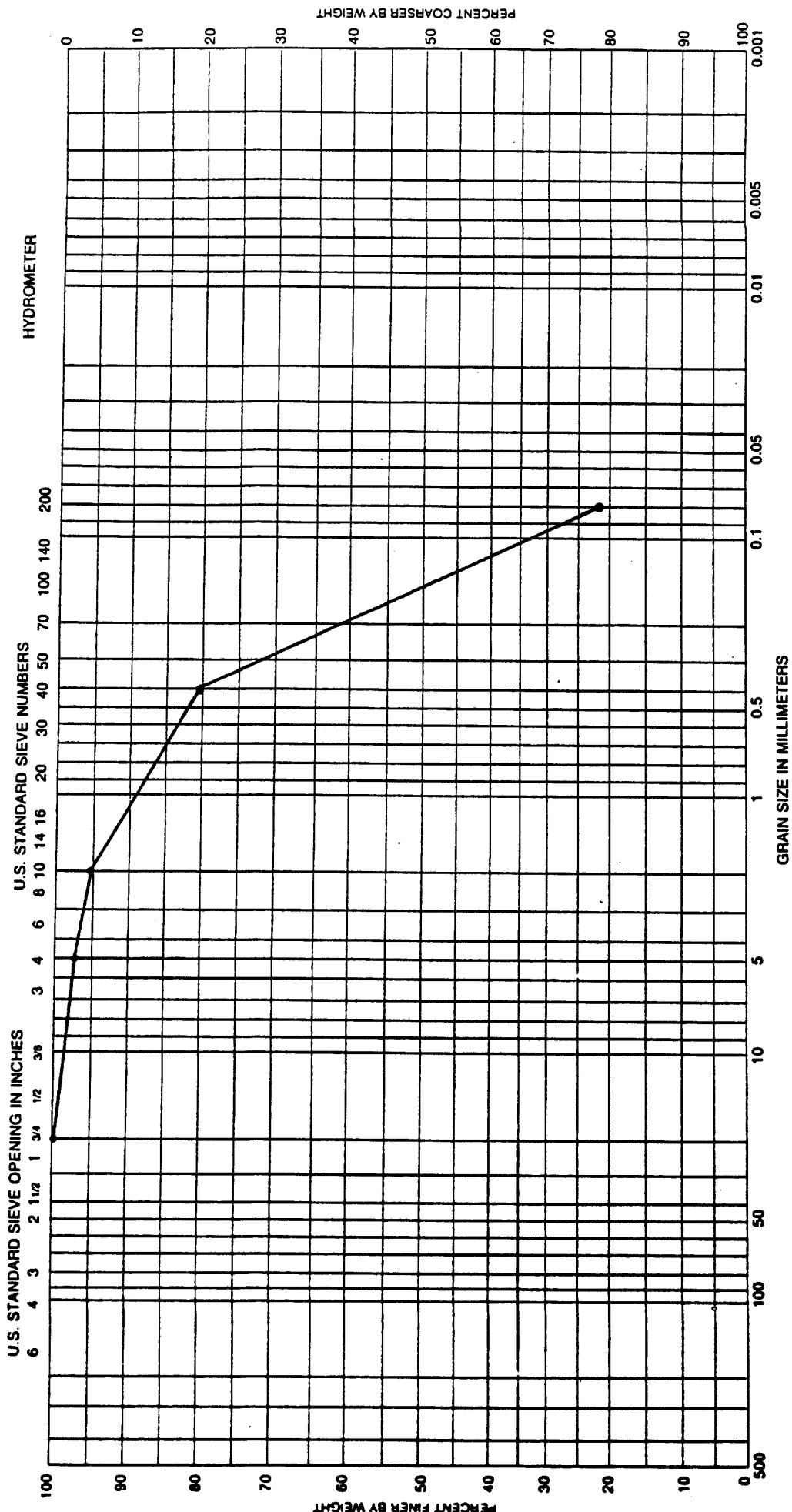


Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-1 - 12	55'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff, Dry (CL)	26	17	9	

Project	Amarillo MSMLF
Area	
Boring No.	MW-1
Date	8-4-94

GRADATION CURVES



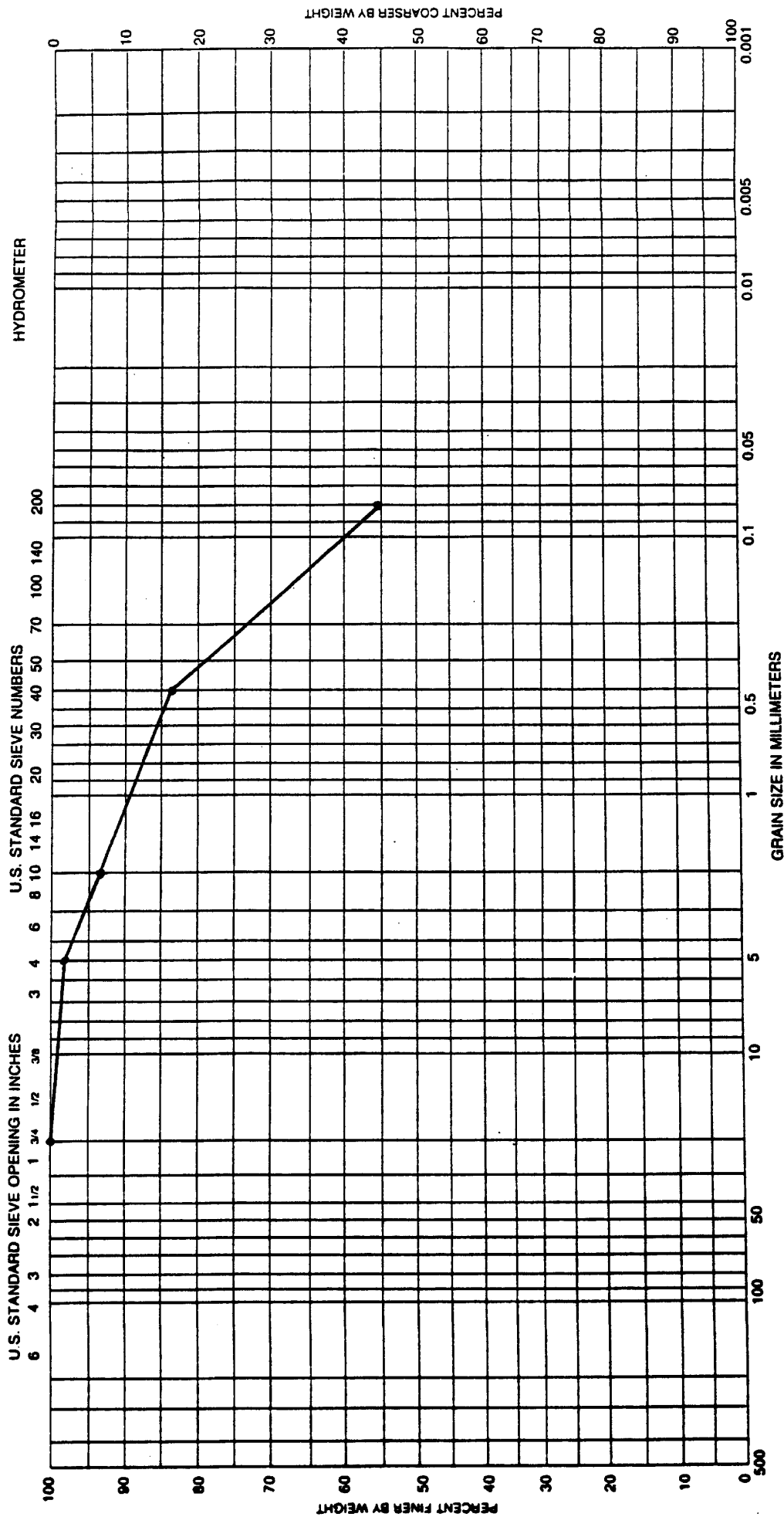
Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-1 - 13	60'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff, Dry (CL)	19	14	5	

Project	Amarillo MSW-LF
Area	
Boring No.	MW-1
Date	8-4-94

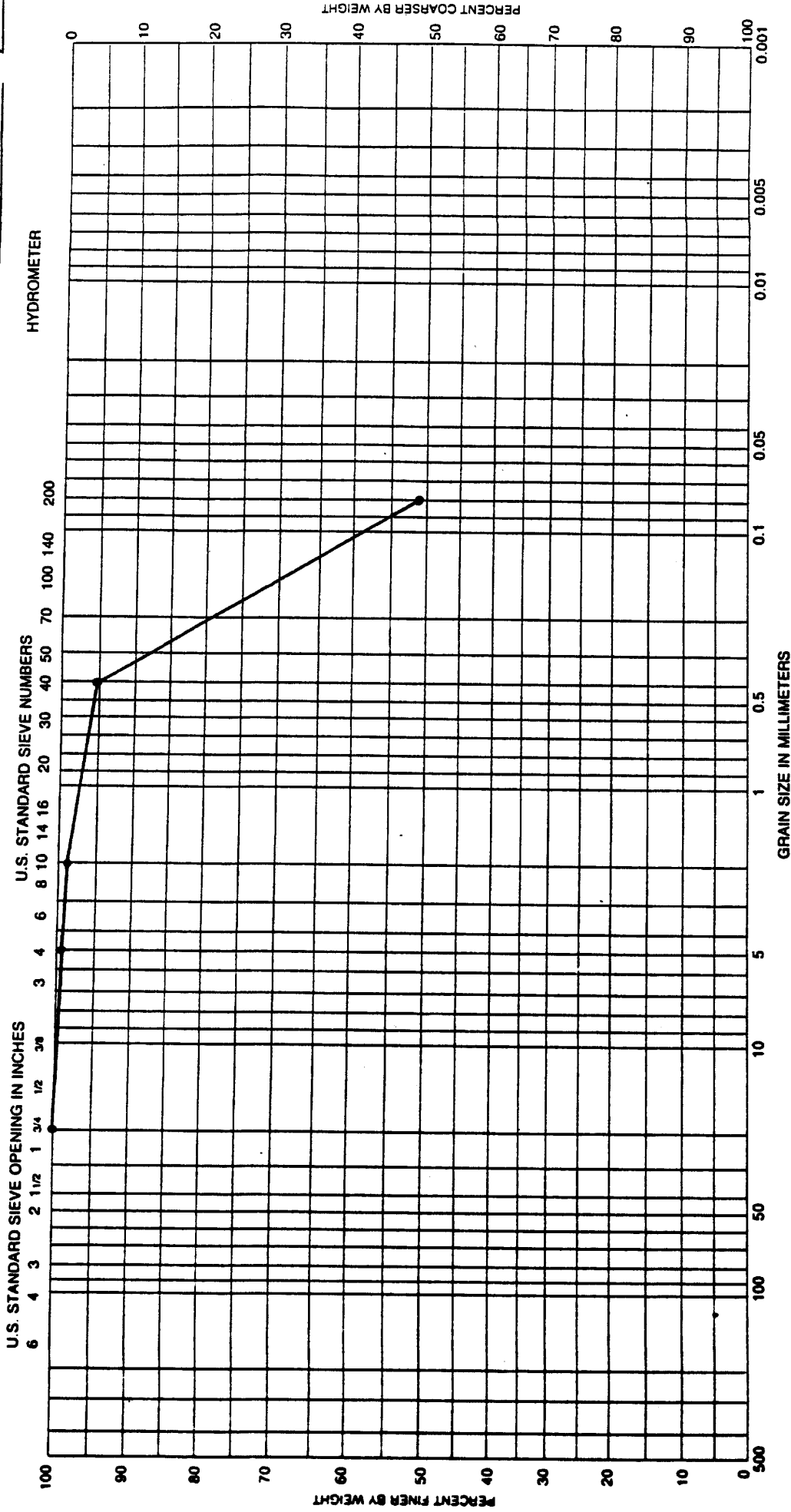
GRADATION CURVES





COBBLES		GRAVEL		SAND		SILT OR CLAY	
COARSE		FINE		NEUTRAL		FINE	
Sample No.	Elev or Depth	Classification				PI	Project
MW-1 - 14	65'	Sandy Clay: Light Tan, Caliche, Stiff, Dry (CL)				6	Amarillo MSW-LF
		Net w %	LL	PL		Area	
			21	15		Boring No.	MW-1
						Date	8-4-94

**GRADATION CURVES**



Sample No.	Elev or Depth	Classification	GRAVEL			SAND			PI	PL	LL	Net w %	PI
			COARSE	FINE	COARSE	NEUTRAL	FINE						
MM-1 - 15	70'	Caliche: Light Tan, Limestone, Fractures. Hard (CL)							18	23		5	

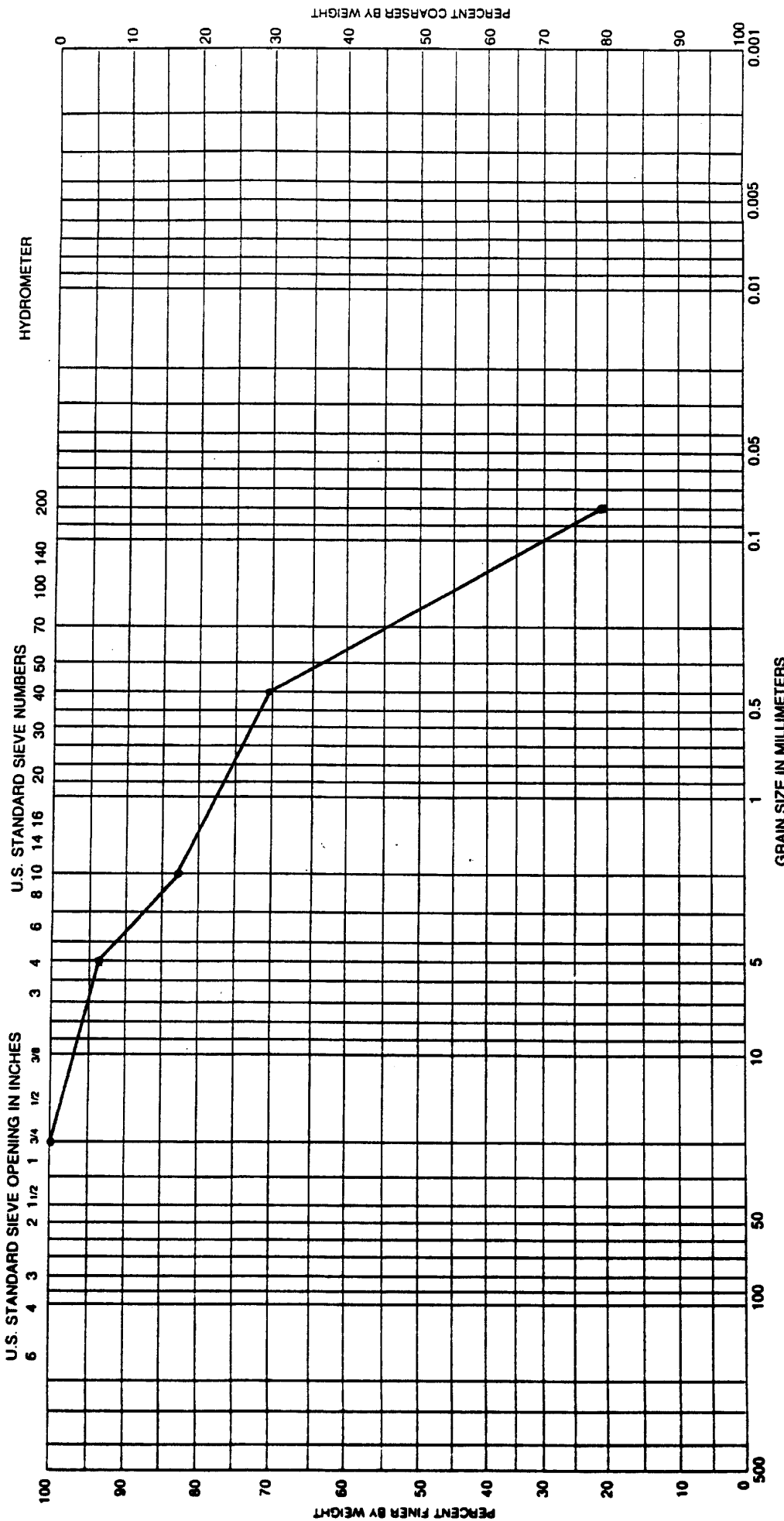
Project: Amarillo MSW-LF

Area:

Boring No.: MW-1

Date: 8-4-94

**GRADATION CURVES**

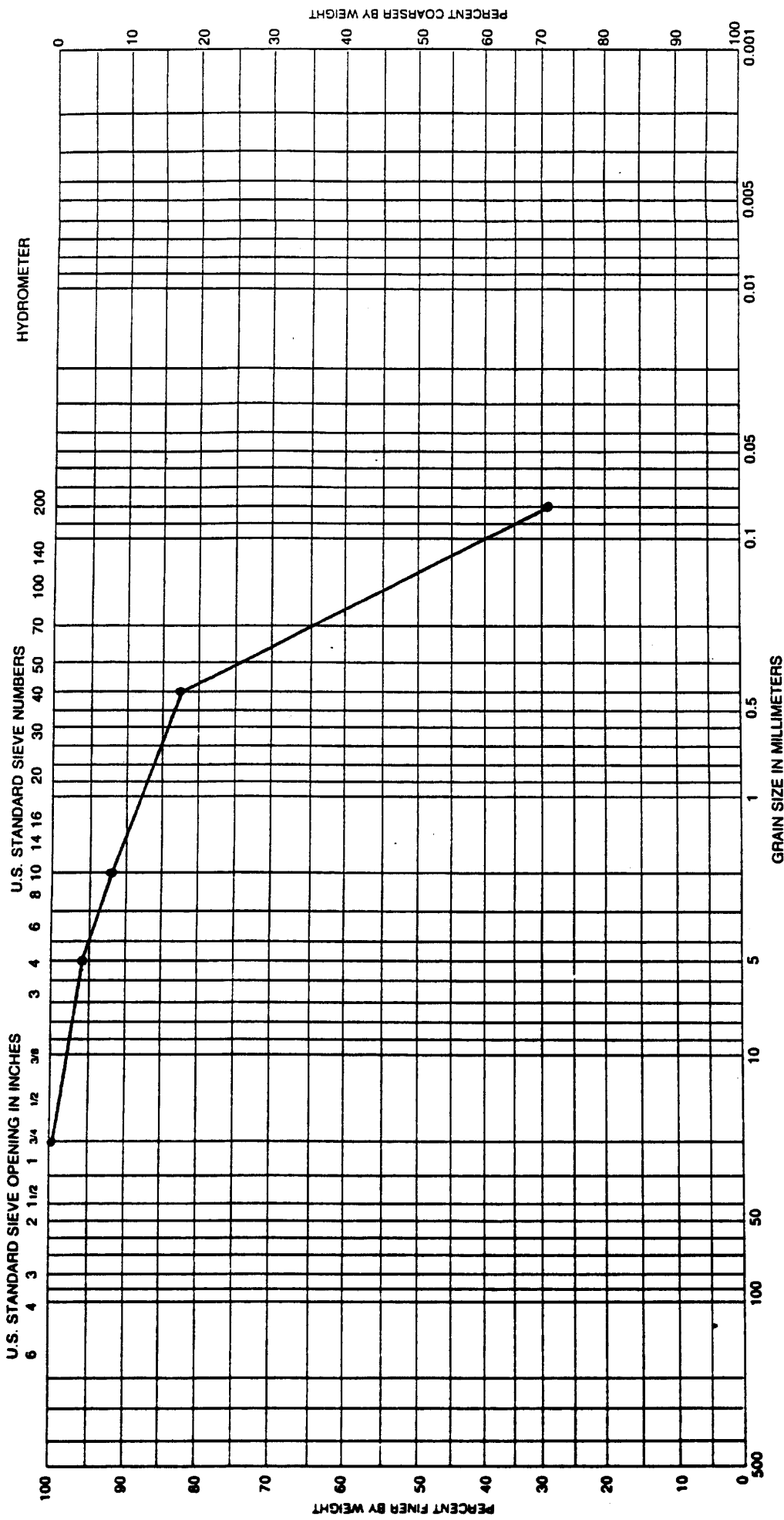


<b>COBBLES</b>	<b>GRAVEL</b>		<b>SAND</b>		<b>SILT OR CLAY</b>	
	COARSE	FINE	COARSE	FINE		
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
MM-1 - 16	75'	Caliche; Light Tan. Limestone Fractures, Hard (CL)		19	16	3
Area			Boring No.	MW-1		Date
						8-4-94

				Project			Amarillo MSW-LF		
				Area					
				Boring No.			MW-1		
				Date			8-4-94		

GRADATION CURVES



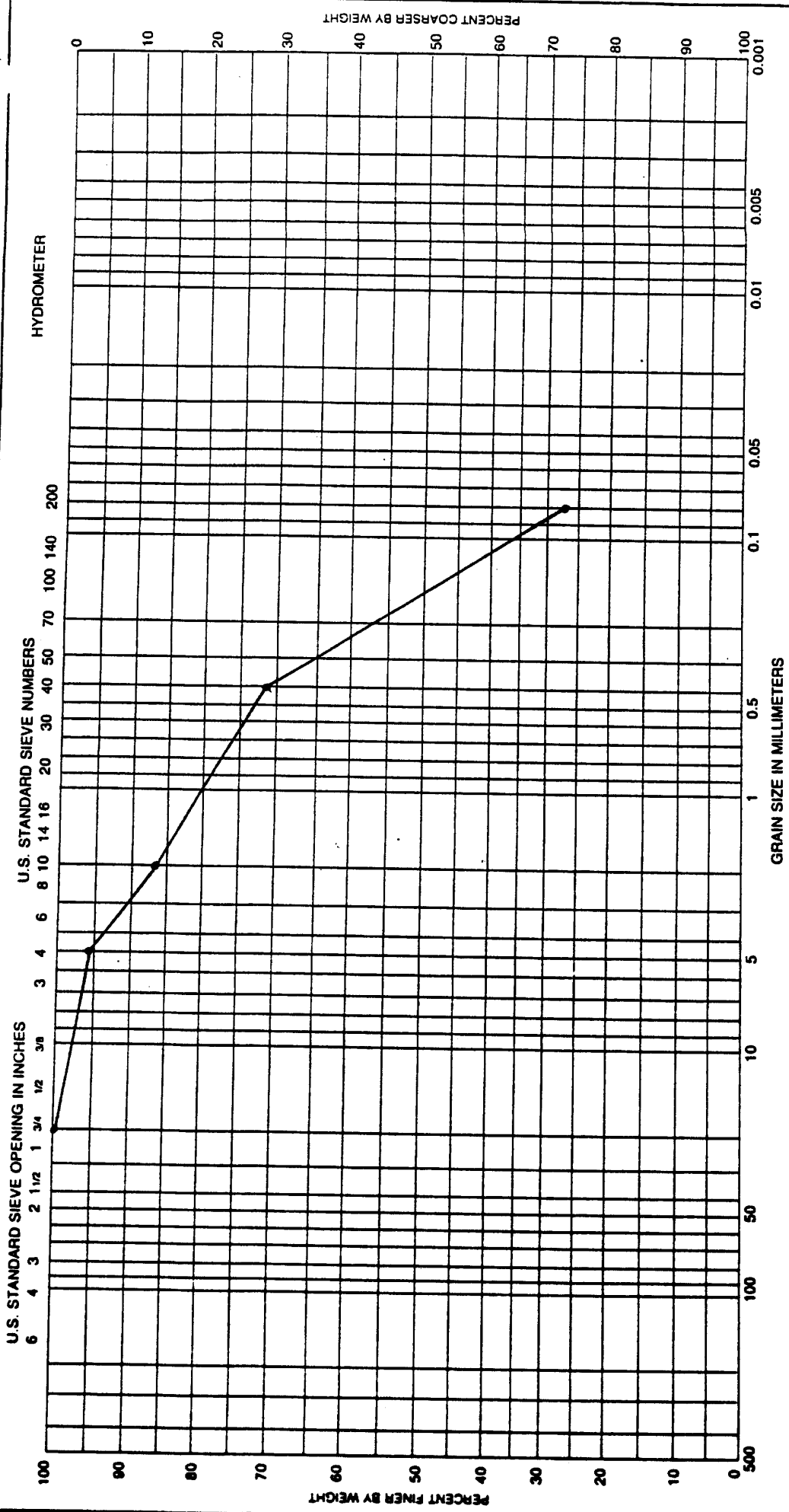


Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MM-1 - 18	85'	Sandy Clay: Light Tan Caliche (CL)	21	17	4	

Project	Amarillo	MSW-LF
Area		
Boxing No.	MW-1	
Date	8-4-94	

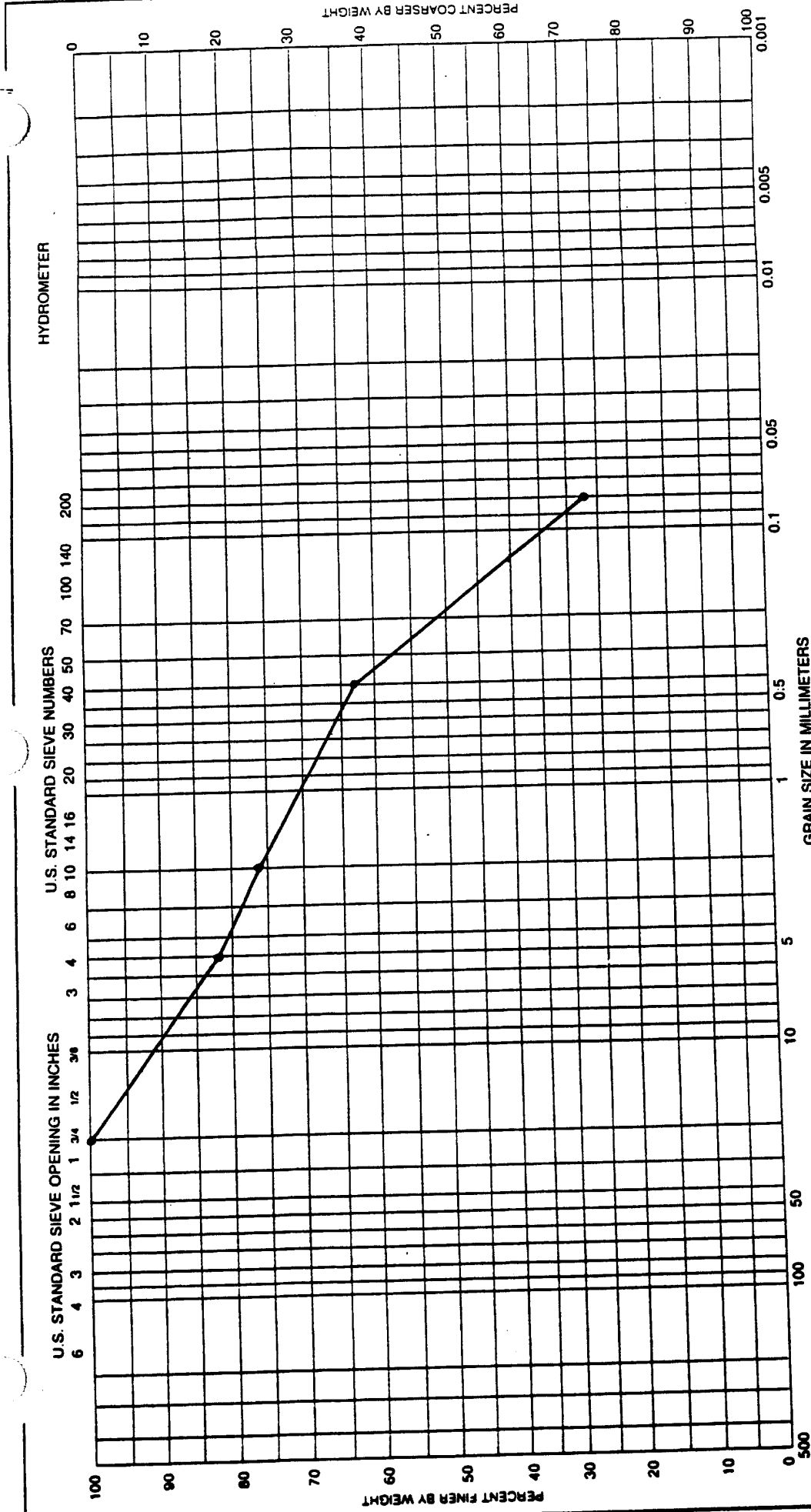
GRADATION CURVES



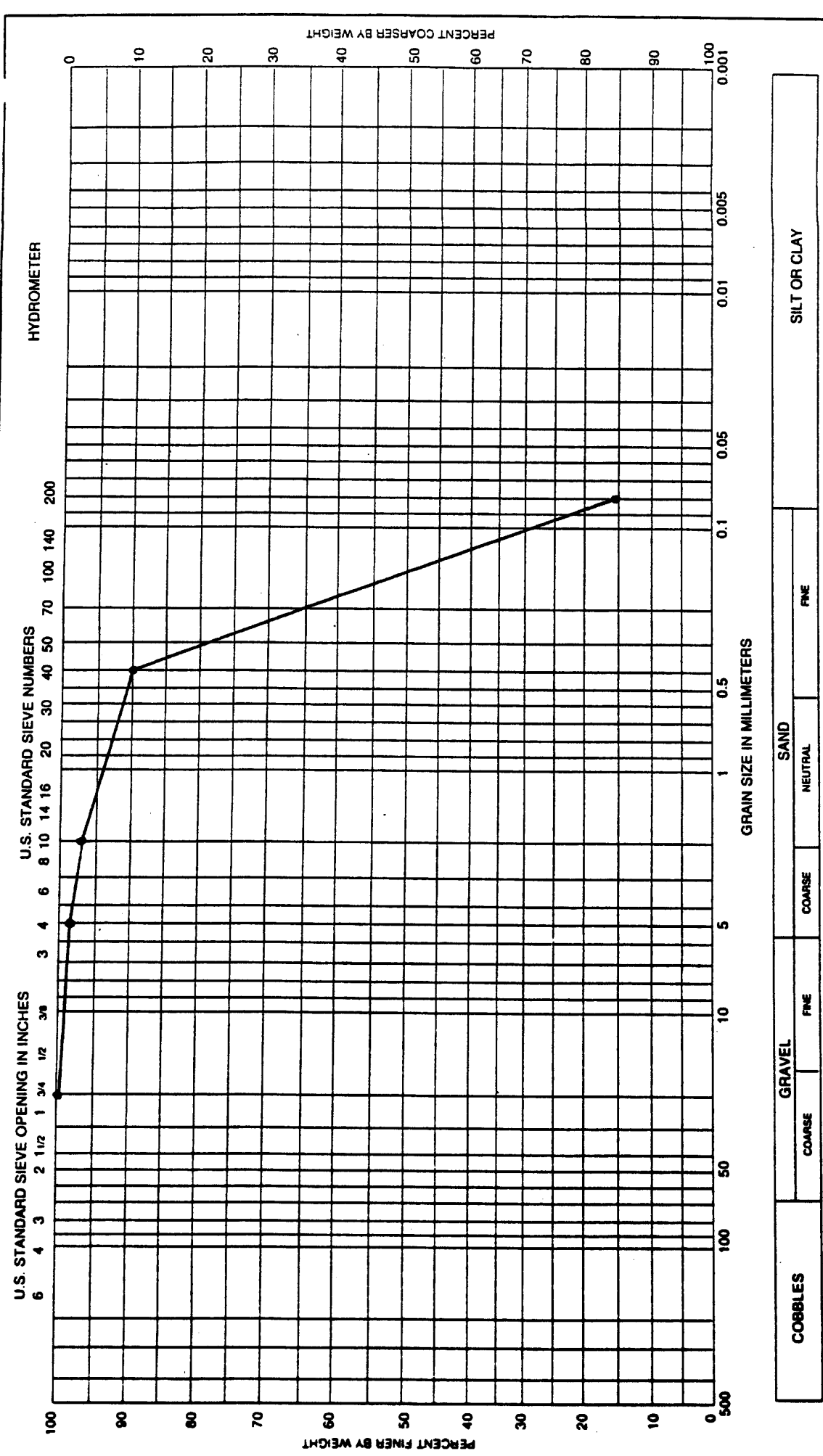
COBBLES	GRAVEL		SAND		SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
MW-1-19	90'	Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff, Dry (SC)		23	20	3	Amarillo MSWLF
							Area
							Boring No.
							MM-1
							Date
							8-4-94

GRADATION CURVES

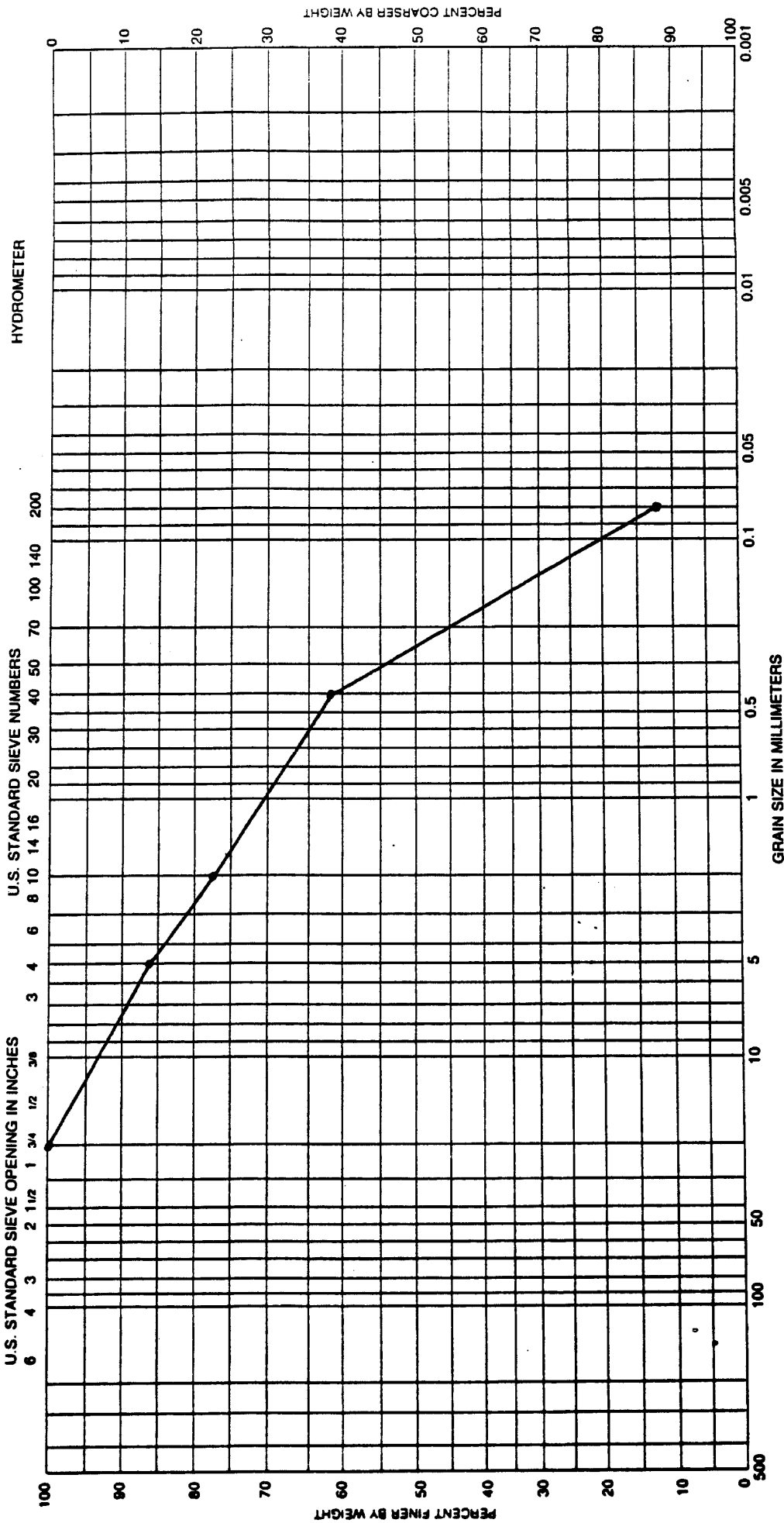


U.S. STANDARD SIEVE OPENING IN INCHES 6 4 3 2 1 1/2 1 3/4 1/2 3/8	U.S. STANDARD SIEVE NUMBERS 10 20 30 40 50 60 70 100 140 200	HYDROMETER 0 10 20 30 40 50 60 70 80 90 100 PERCENT COARSER BY WEIGHT
GRAIN SIZE IN MILLIMETERS		COBBLES
GRAVEL		SAND
COARSE	FINE	COARSE
		NEUTRAL
		FINE
SILT OR CLAY		
Classification		Project
Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff, Dry (SC)		Amarillo MSW-LF
Sample No.	Elev or Depth	Area
MW-1 - 20	95'	MW-1
		Boring No.
		Date
		8-4-94
GRADATION CURVES		
DRESS-PETERSON TESTING LABORATORY, INC.		



	<b>GRAVEL</b>	<b>SAND</b>		<b>SILT OR CLAY</b>				
	COARSE	FINE	COARSE	NEUTRAL	FINE			
<b>Sample No.</b>	<b>Classification</b>							
M-1 - 21	<b>Clayey Sand; Reddish Tan With Calcareous Nodules (10%)</b>							<b>Project</b> <b>Amarillo MSW-LF</b>
<b>Elev or Depth</b>	<b>Stiff, Dry (SC)</b>							<b>Area</b>
100'								<b>Boring No.</b> <b>MW-1</b>
	<b>GRADATION CURVES</b>							<b>Date</b> <b>8-4-94</b>





Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-1 - 22	110'	Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff, Dry (SC)	15	10	5	

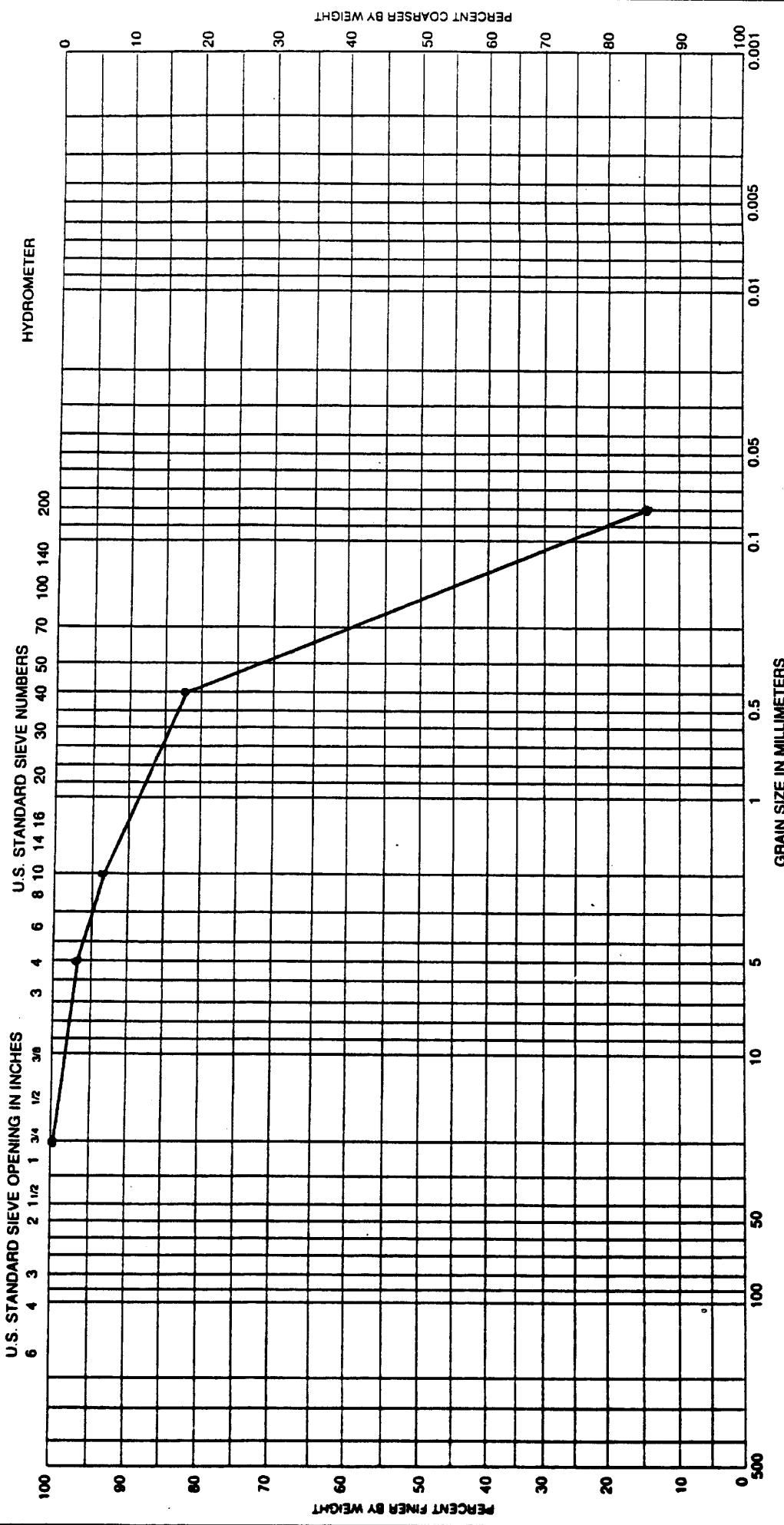
  

COBBLES	GRAVEL		SAND		SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE	

Project	Amarillo MSW-LF
Area	
Boring No.	MW-1
Date	8-4-94

GRADATION CURVES



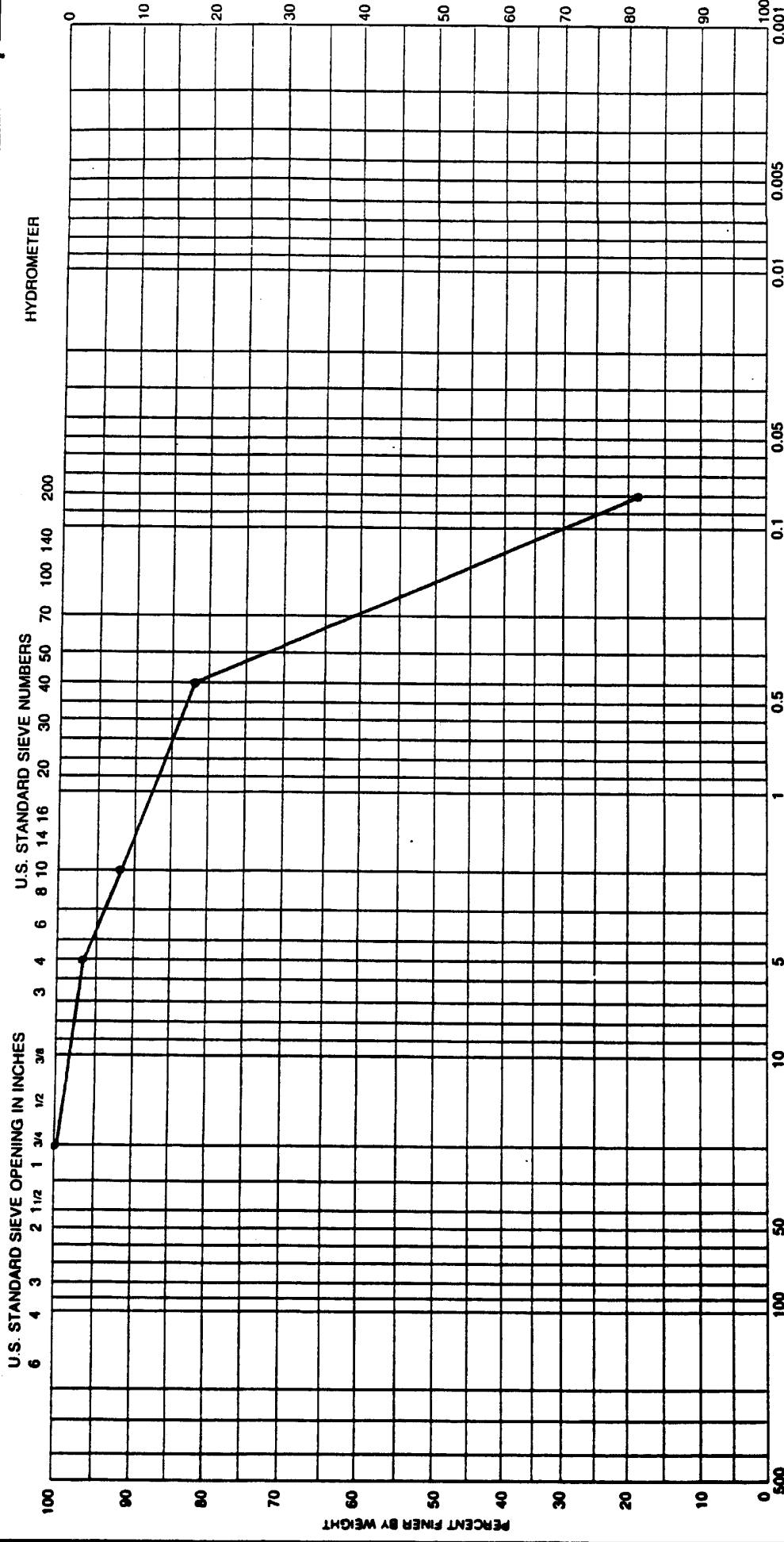
Sample No.	Elev or Depth	Classification	SAND			SILT OR CLAY			
			Net w %	LL	PL	PI	Area	Boring No.	Date
MW-1 - 23	120'	Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff, Dry (SC)	16	12	4	Amarillo	MSW-LF	MW-1	8-4-94
<b>GRADATION CURVES</b>									

U.S. STANDARD SIEVE OPENING IN INCHES  
 6 4 3 2 1 1/2 1 3/4 1/2 3/8

U.S. STANDARD SIEVE NUMBERS  
 10 20 30 40 50 60 70 100 140 200

HYDROMETER

PERCENT COARSER BY WEIGHT

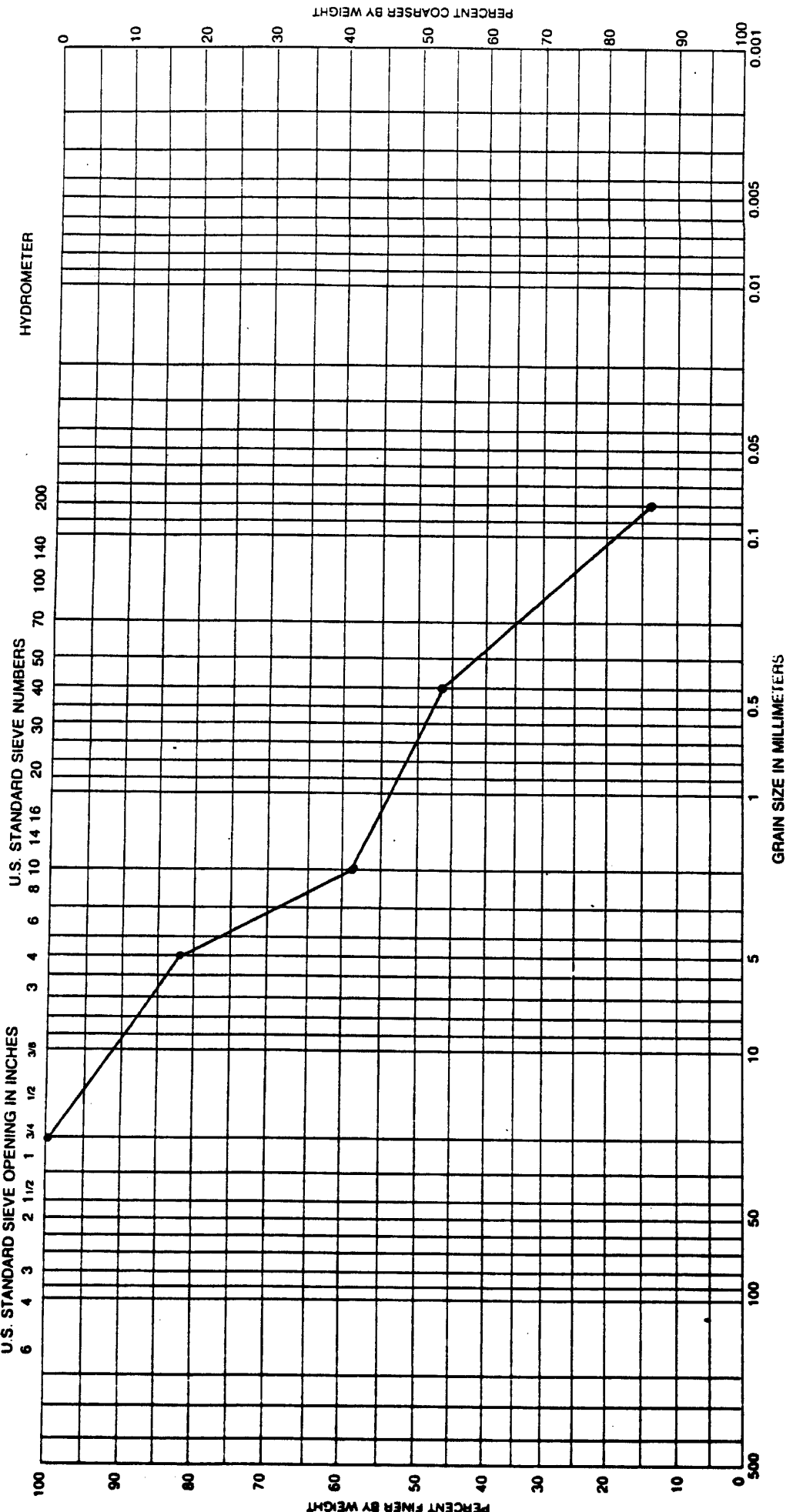


GRAIN SIZE IN MILLIMETERS

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	NEUTRAL	COARSE	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
MW-1 - 24	130'	Clayey Sand; Reddish Tan With Calcareous Nodules (10%) Stiff, Dry (SC)				
Project		Amarillo MSW-LF				
Area						
Boring No.		MW-1				
Date		8-4-94				

GRADATION CURVES



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

COBBLES		GRAVEL		SAND			SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	FINE		
Sample No.	Elev or Depth	Classification					PI	Project
MM-1 - 25	200'	Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff, Dry (SC)					LL 20	Amarillo MSW-LF
							PL 16	
								Area
								Boring No.
								MW-1
								Date
								8-4-94

GRADATION CURVES

**LOG OF BORING**

**MW - 2**

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-2  
 LOCATION: Amarillo, Texas

Date: 7-15-94 thru 7-20-94

Ground Elevation: 3805.39'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Auger drilled to 74' Groundwater encountered at 215'									
			DESCRIPTION OF STRATUM									
0	/	X	Sandy Clay: Dark Brown, Stiff Dry (CL) K = 4.5 X 10 <sup>-8</sup> cm/sec		13-6"	9.5		38	18	20	1.5	94.5
					18-12"							
-5	/	X	Sandy Clay: Reddish Tan w/Calcareous Nodules(8%) Stiff, Dry (CL)		50-5"	8.5		36	15	21	3.5	92.1
-10	/	X			50-4"	6.2		29	18	11	3.0	91.7
-15	/	X			50-5"	8.6		32	13	19	3.25	85.4
-20	/	X			50-4"	9.7		35	15	20		91.4
-25	/	X			50-5"	9.3		38	23	15	3.5	91.8
-30	/	X										

Continued on Page 2

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-2  
 LOCATION: Amarillo, Texas

Date: 7-15-94 thru 7-20-94

Ground Elevation: 3805.39'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary								
			SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE	
DESCRIPTION OF STRATUM											
30	/	X	50-3"	5.8		32	21	11	4.0+	81.1	
35	/	X	Caliche: Light Tan, Limestone, Fractures, Hard (CL)	50-3"	11.9		29	20	9	4.0+	79.2
40	/	X	Sandy Clay: Reddish Tan w/Calcareous Nodules(10%) Stiff, Dry (CL)	50-4"	11.5		32	19	13	3.25	7
45	/	X		50-4"	10.5		31	18	13	3.50	73.0
50	/	X		50-5"	7.7		37	15	22	2.50	73.9
55	/	X		50-4"	5.5		34	22	12	2.0	82.6
60	/	/									

Continued on Page 3

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-2  
 LOCATION: Amarillo, Texas

Date: 7-15-94 thru 7-20-94

Ground Elevation: 3805.39'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Auger drilled to 74' Groundwater encountered at 215'								
60	/	X		50-4"	4.2		31	15	16	2.5	62.2
65	/										
70	/										
75	/	X	Caliche: Light Tan Limestone Layers, Fractures, Hard (CL)	50-3" MD			31	17	14	3.5	45.9
80	/	X		50-5" MD			28	18	10		40.8
85	/	X		22-6" MD			23	18	5	1.5	30.7
90	/			50-11.5"							

Continued on Page 4



## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-2  
 LOCATION: Amarillo, Texas

Date: 7-15-94 thru 7-20-94

Ground Elevation: 3805.39'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SEVE
			GROUNDWATER INFORMATION: Auger drilled to 74' Groundwater encountered at 215'									
90	○	X			24-6"	MD		27	20	7	1.0	83.4
					50-12"							
95	○	X			50-6"	MD		34	20	14	2.5	81.0
100	○	X			25-6"	MD		21	17	4	1.25	1'
105	○	X	Clayey Sand: Reddish Tan w/Calcareous Nodules(10%) Stiff Dry (SC)		50-5"	MD		25	21	4	3.0	80.1
110	○	X			50-5"	MD		22	19	3		27.8
115	○											
120	○											

Continued on Page 5

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-2  
 LOCATION: Amarillo, Texas

Date: 7-15-94 thru 7-20-94

Ground Elevation: 3805.39'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO 200 SIEVE
			GROUNDWATER INFORMATION: Auger drilled to 74' Groundwater encountered at 215'									
			DESCRIPTION OF STRATUM									
120	○	X										
-125	○											
-130	○	X	Clayey Sand: Reddish Tan, w/Calcareous Nodules(10%) Stiff, Dry (SC)									
-135	○											
-140	○	X	50-5" MD									
-145	○											
-150	○											

Continued on Page 6

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-2  
 LOCATION: Amarillo, Texas

Date: 7-15-94 thru 7-20-94

Ground Elevation: 3805.39'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE											
			GROUNDWATER INFORMATION: Auger drilled to 74' Groundwater encountered at 215'																				
			DESCRIPTION OF STRATUM																				
150	○	X																					
													40-6" MD								NP		16.0
			50-7.5"																				
155	○	X																					
160	○	X																					
													39-6" MD								NP		2
			50-8"																				
165	○	X																					
170	○	X	Clayey Sand: Reddish Tan, w/Calcareous Nodules(15%) Stiff, Dry (SC)																				
													50-5" MD								NP	3.0	20.7
			Organic Carbon Content (*) *237.1 MG/KG																				
175	○	X																					
180	○	X																					

Continued on Page 7



# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-2  
 LOCATION: Amarillo, Texas

Date: 7-15-94 thru 7-20-94

Ground Elevation: 3805.39'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Auger drilled to 74' Groundwater encountered at 215'									
			DESCRIPTION OF STRATUM									
210	(Symbol: Diagonal lines with dots)	X	*482.80 MG/KG		50.4"	MD				NP		
			Sand: Tan, Well Sorted, Fine Grain (SC)									
215												
220		X			50-1"	MD						
225												
230		X	Sand: Tan, Coarse Grain w/Small Pea Gravel (30%) (SC) *336.34 MG/KG		50-1"	MD						
235												
240												

Continued on Page 9

# LOG OF BORING

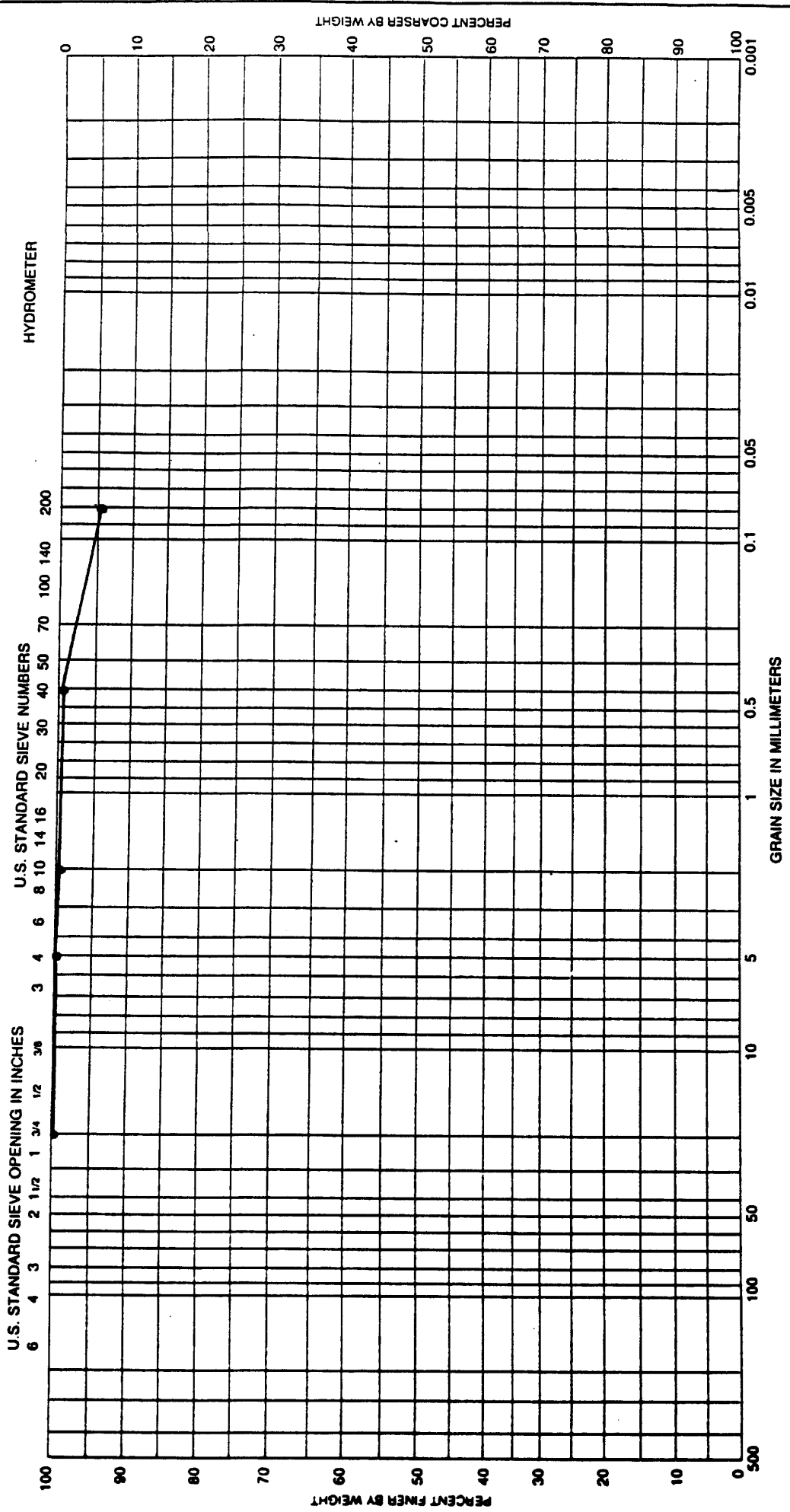
PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-2  
 LOCATION: Amarillo, Texas

Date: 7-15-94 thru 7-20-94

Ground Elevation: 3805.39'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Auger Drilled to 74' Groundwater encountered at 215'								
			DESCRIPTION OF STRATUM								
240	(Symbol: Diagonal lines and circles)	(Symbol: X)	Sand: Tan, Coarse Grain w/Small Pea Gravel (SC) *529.70 MG/KG	50-3"	MD					NP	2.0
245	(Symbol: Diagonal lines and circles)	(Symbol: X)		50-2.5"	MD						
* T.D. - 245' *											



Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-2 - 1	0'-2'	Sandy Clay; Dark Brown Stiff, Dry (CL)	38	18	20	

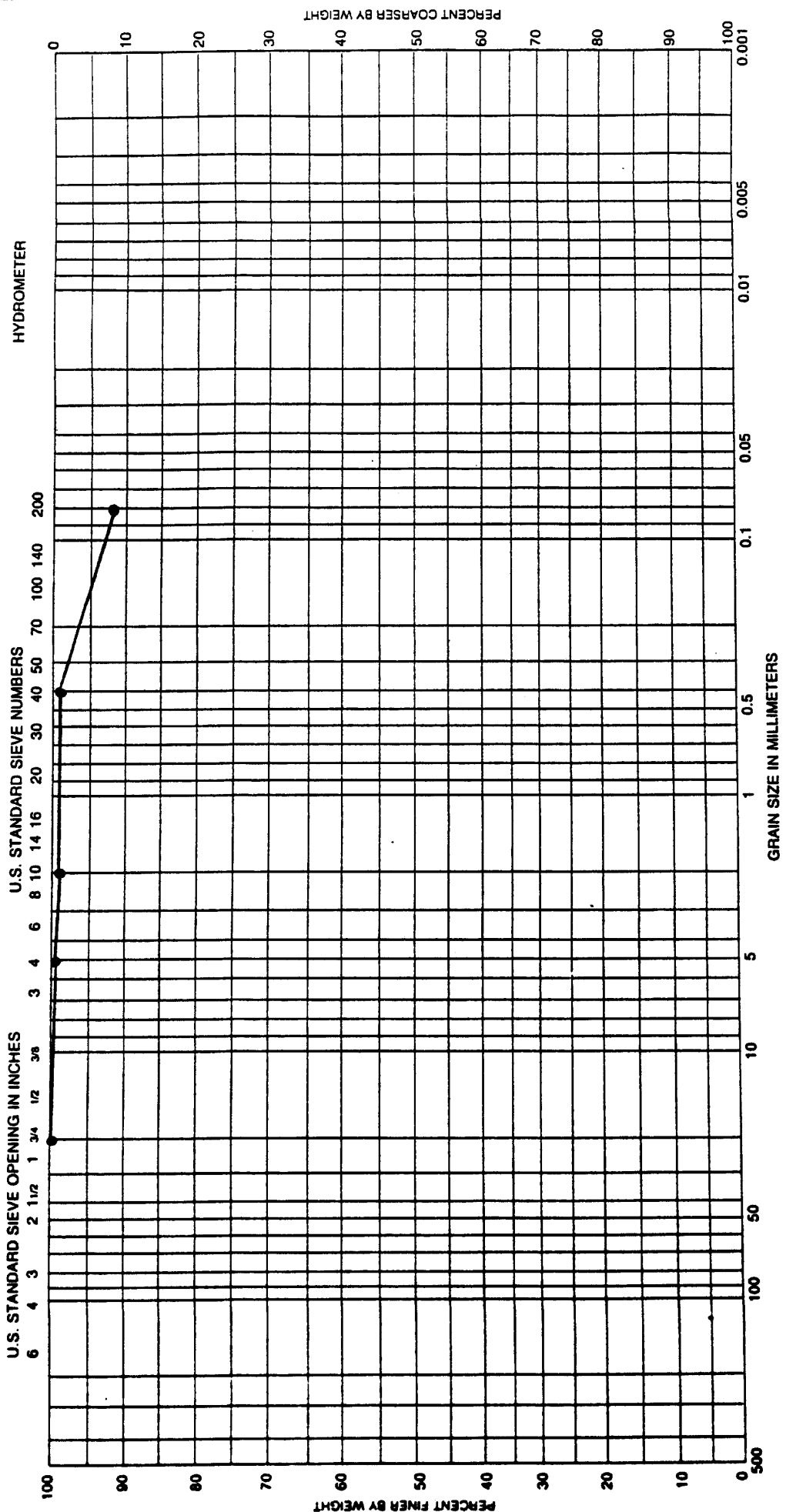
  

COBBLES	GRAVEL COARSE FINE	SAND NEUTRAL	FINE	SILT OR CLAY
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Project	Amarillo MSW-LF
Area	
Boring No.	MW-2
Date	7-15-94

GRADATION CURVES



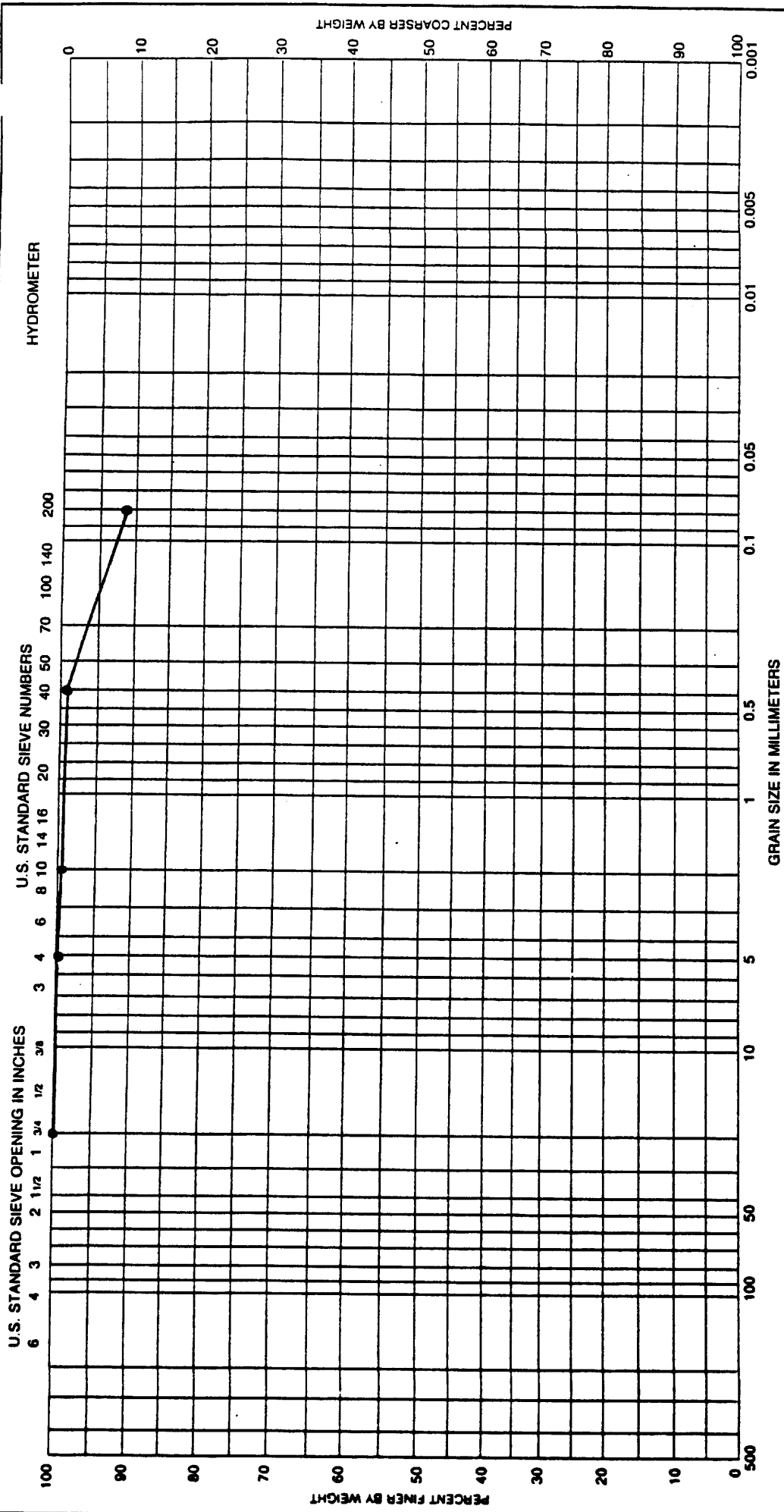
Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-2-2	5'	Sandy Clay; Reddish Tan With Calcareous Nodules (8%) Stiff Dry (Cl)	36	15	21	

Project	Amarillo MSW-LF
Area	
Boring No.	MW-2
Date	7-15-94

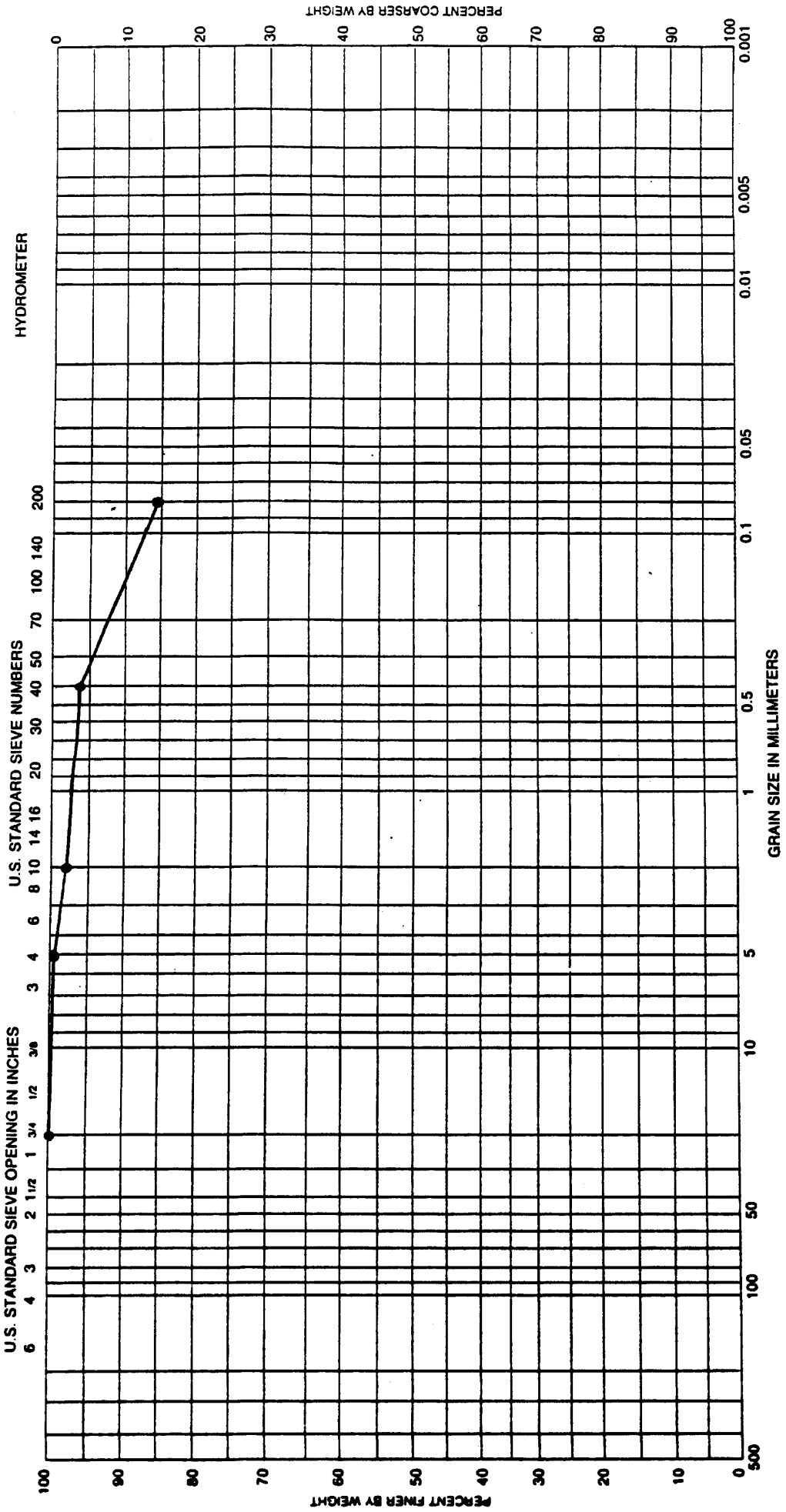
**GRADATION CURVES**





COBBLES		GRAVEL		SAND			SILT OR CLAY			
		COARSE	FINE	NEUTRAL		FINE				
Sample No.	Elev or Depth	Classification						LL	PL	PI
MW-2-3	10'	Sandy Clay; Reddish Tan With Calcareous Nodules (8%) Stiff Dry (CL)						29	18	11
						Area	MW-2			
						Boring No.	MW-2			
						Project	Amarillo MSW-LF			
						Date	7-15-94			

**GRADATION CURVES**



Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-2-4	15'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff Dry (CL)	32	32	19	

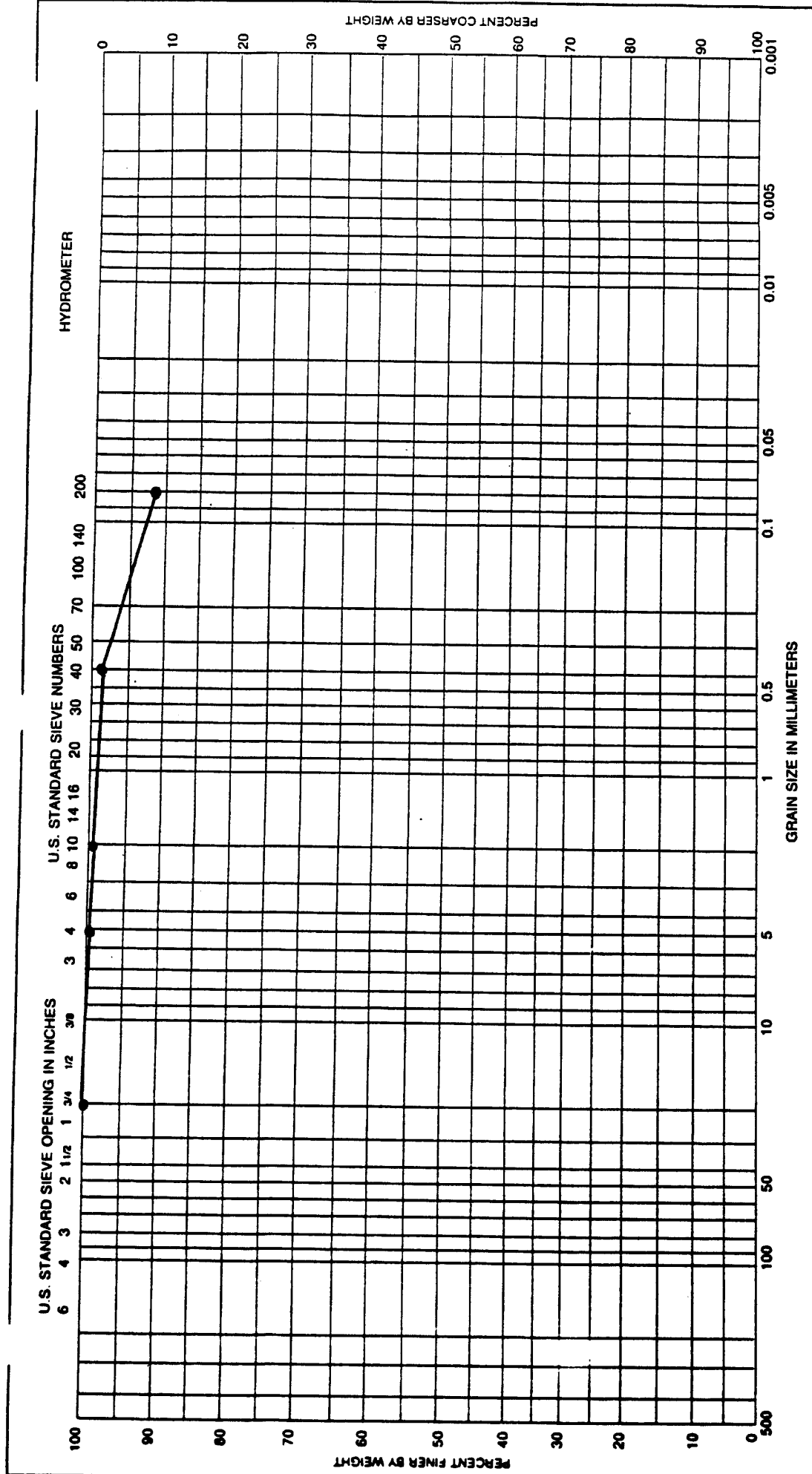
  

COBBLES	GRAVEL COARSE	FINE	COARSE	NEUTRAL	FINE	SILT OR CLAY
---------	------------------	------	--------	---------	------	--------------

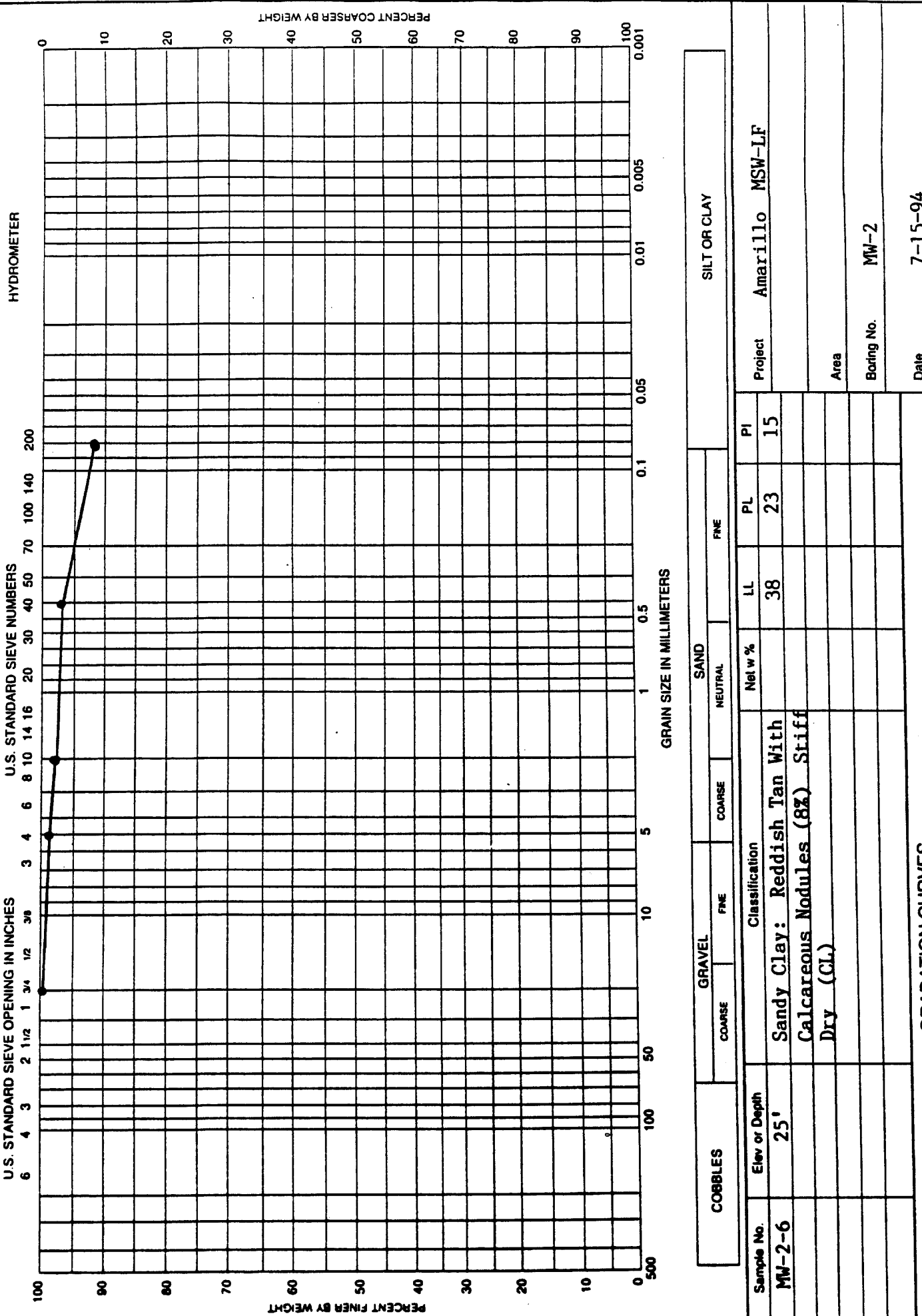
  

Project	Amarillo	MSW-LF
Area		
Boring No.	MW-2	
Date	7-15-94	

GRADATION CURVES

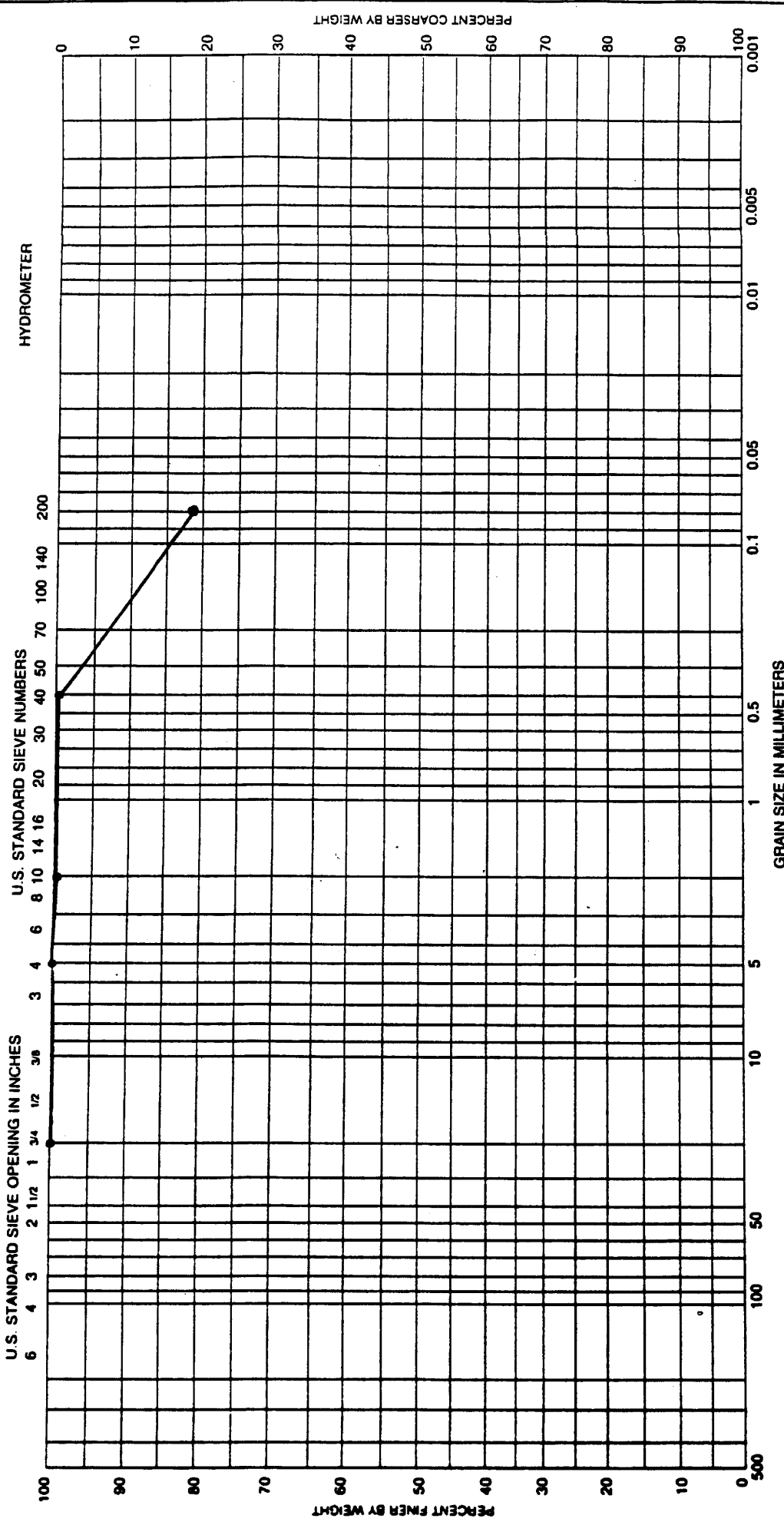


COBBLES	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	COARSE	NEUTRAL	FINE		
Sample No.	Elev or Depth	Classification					
MW-2-5	20'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff Dry (CL)					
		Net w %	LL	PL	PI	Project Amarillo MSW-LF	
			35	15	20	Area	
						Boring No. MW-2	
						Date 7-15-94	
GRADATION CURVES							

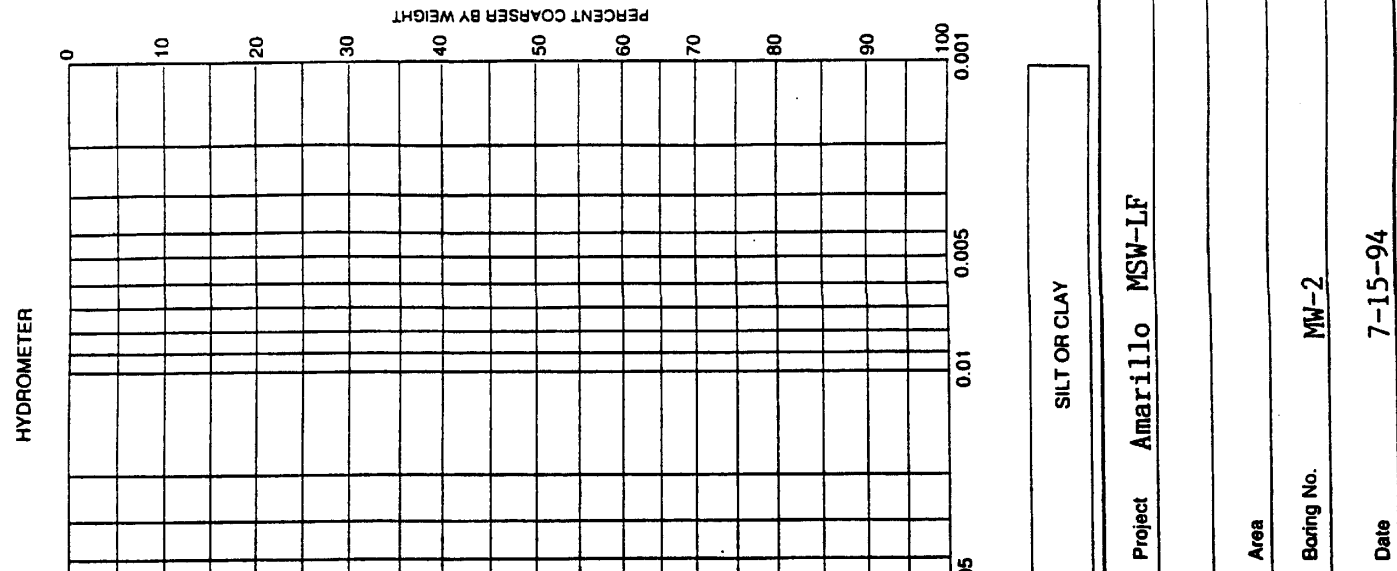


COBBLES	GRAVEL		SAND		SILT OR CLAY	
	COARSE	FINE	COARSE	NEUTRAL	FINE	
Sample No.	Elev or Depth	Classification			LL	PI
MW-2-6	25'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff Dry (CL)			38	15

**GRADATION CURVES**

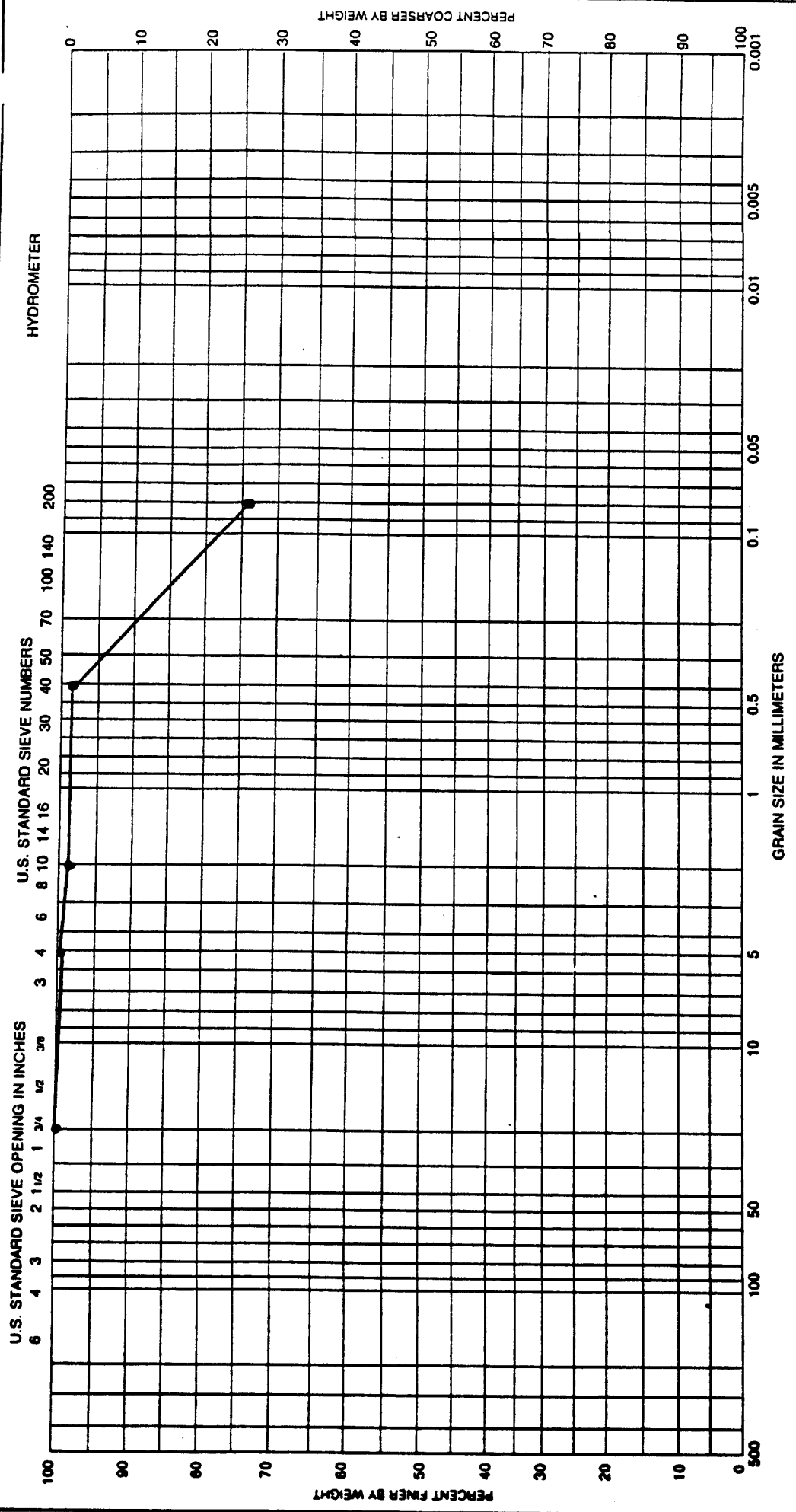


<b>COBBLES</b>		<b>GRAVEL</b>		<b>SAND</b>		<b>SILT OR CLAY</b>	
COARSE		FINE		NEUTRAL		FINE	
Sample No.	Elev or Depth	Classification					
MW-2-7	30'	Sandy Clay: Reddish Tan With Calcareous Nodules (8%) Stiff Dry (CL)					
		Net w %	LL	PL	PI	Project	
			32	21	11	Amarillo MSW-LF	
						Area	
						Boring No. MW-2	
						Date	
						7-15-94	
<b>GRADATION CURVES</b>							



<b>COBBLES</b>			<b>GRAVEL</b>		<b>SAND</b>			<b>SILT OR CLAY</b>		
		COARSE	FINE	COARSE	NEUTRAL	FINE				
Sample No.	Elev or Depth	Classification							PI	
MW-2-8	35'	Caliche: Light Tan, Limestone Fractures, Hard (CL)							9	Project Amarillo MSW-LF
									LL 29	
									PL 20	
										Area
										Boring No. MW-2
										Date 7-15-94
<b>GRADATION CURVES</b>										

QUEST-PETERSON TESTING LABORATORY, INC.



<b>COBBLES</b>		<b>GRAVEL</b>		<b>SAND</b>		<b>SILT OR CLAY</b>	
	COARSE	FINE	COARSE	NEUTRAL	FINE		
Sample No.	Classification						
MW-2-9	Sandy Clay: Reddish Tan With Calcareous Nodules (10%) Stiff Dry (CL)						
Elev or Depth	40'	Net w %		LL	32	PL	19
		PI	13				
		Project	Amarillo MSW-LF				
		Area					
		Boring No.	MW-2				
		Date	7-15-94				
<b>GRADATION CURVES</b>							

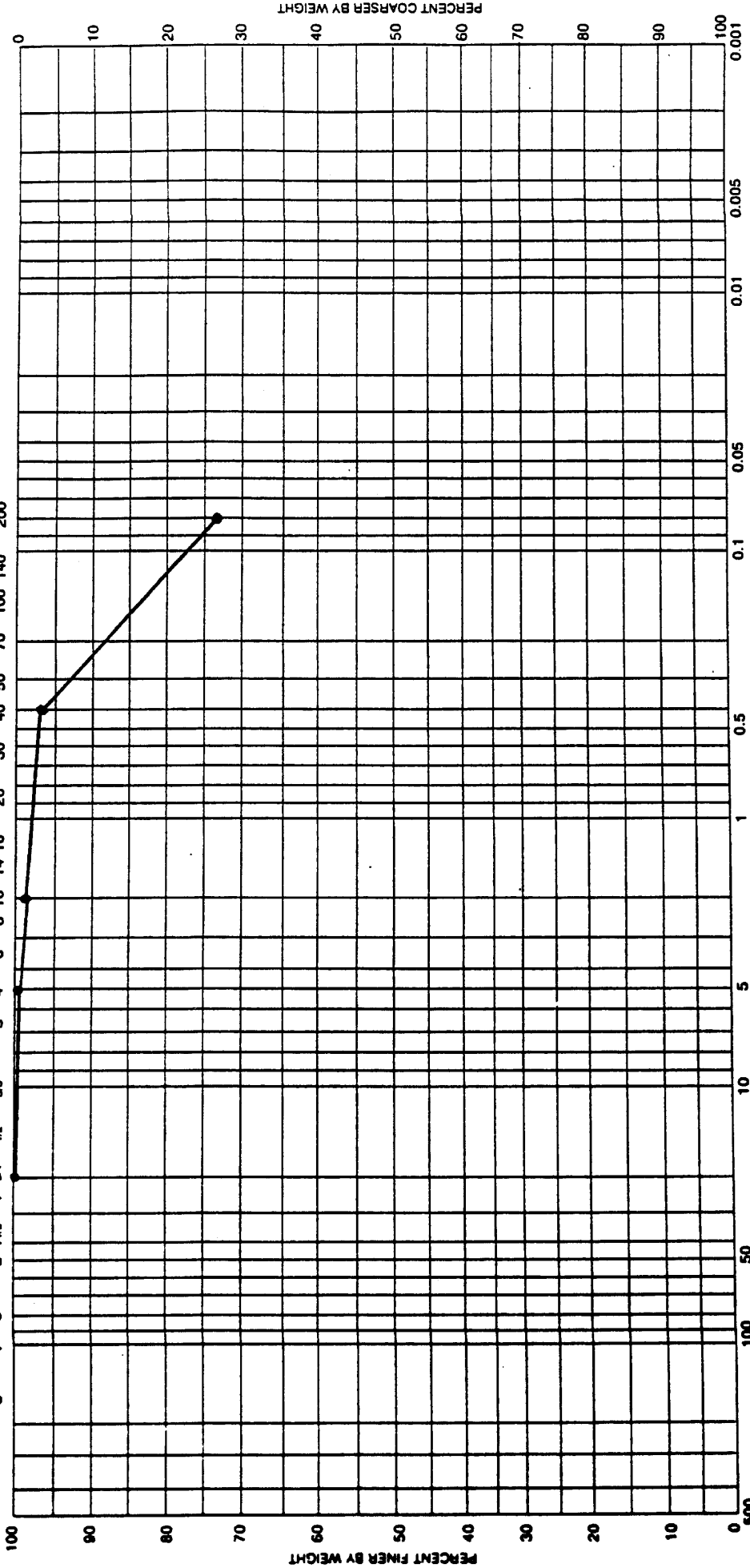
U.S. STANDARD SIEVE OPENING IN INCHES

6 4 3 2 1 1/2 1 3/4 1/2 3/8

U.S. STANDARD SIEVE NUMBERS

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HYDROMETER



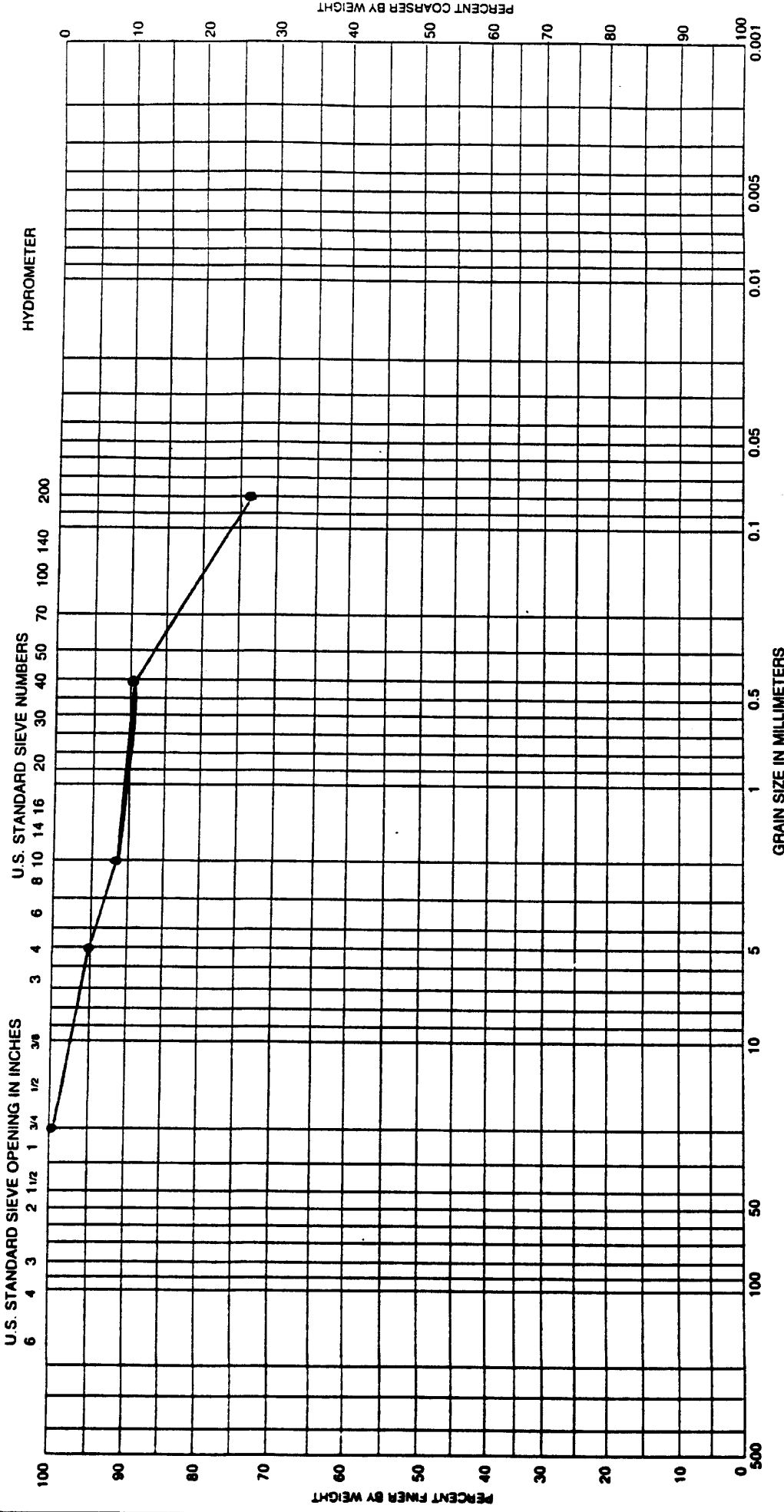
PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

COBBLES		GRAVEL		SAND			SILT OR CLAY		
	COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI	
Sample No.	Classification					Net w %			Project
MW-2-10	Sandy Clay: Reddish Tan With Calcareous Nodules (10%) Stiff Dry (CL)					31	18	13	Amarillo MSW-LF
Elev or Depth									Area
45'									Boring No. MW-2
									Date
									7-15-94

GRADATION CURVES



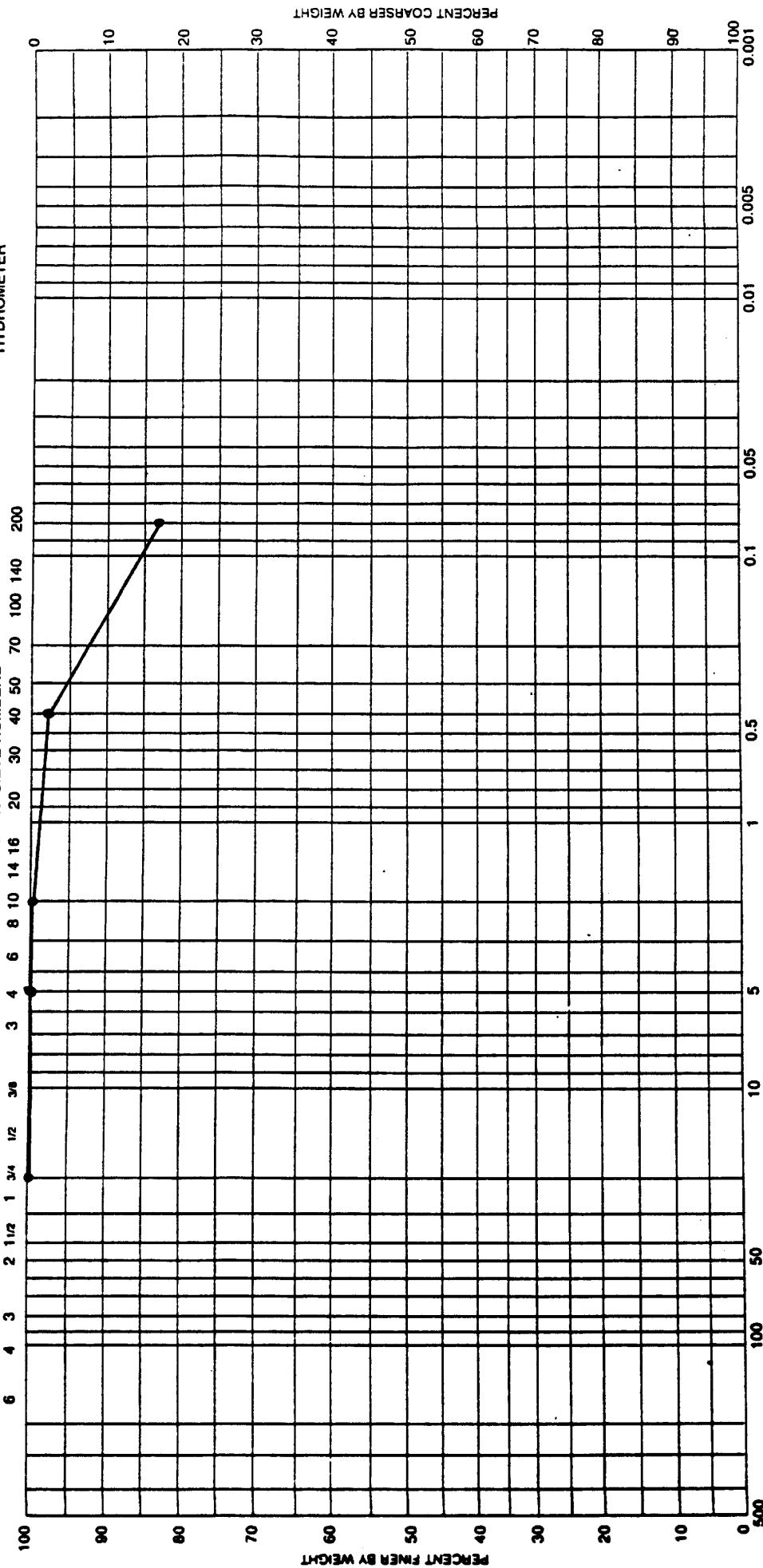


COBBLES		GRAVEL		SAND		SILT OR CLAY	
	COARSE	FINE	COARSE	NEUTRAL	FINE		
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
MW-2-11	50'	Sandy Clay; Reddish Tan With Calcareous Nodules (10%) Stiff Dry (CL)		37	15	22	Amarillo MSW-LF
							Area
							Boring No.
							MW-2
							Date
							7-15-94
<b>GRADATION CURVES</b>							

HYDROMETER

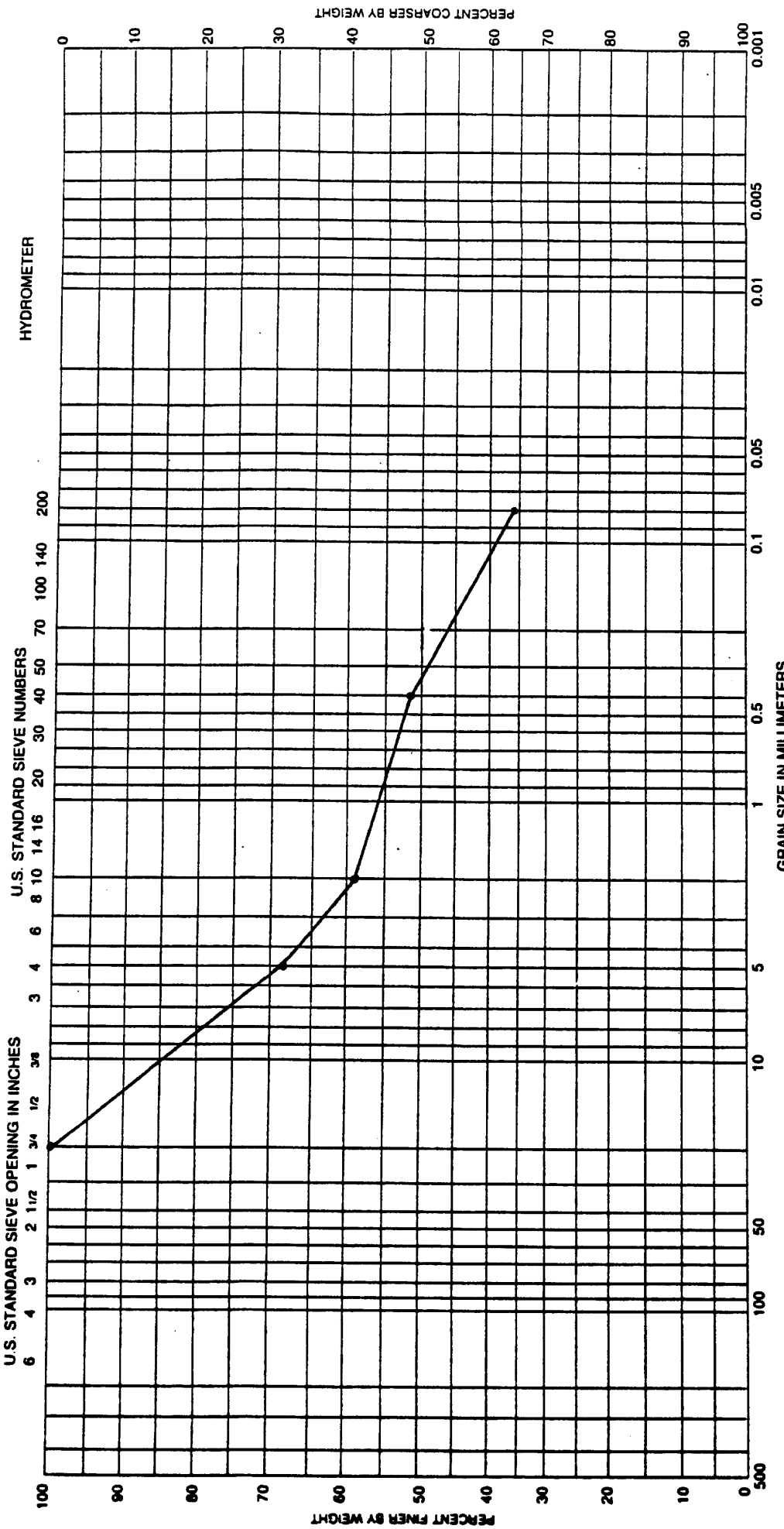
U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

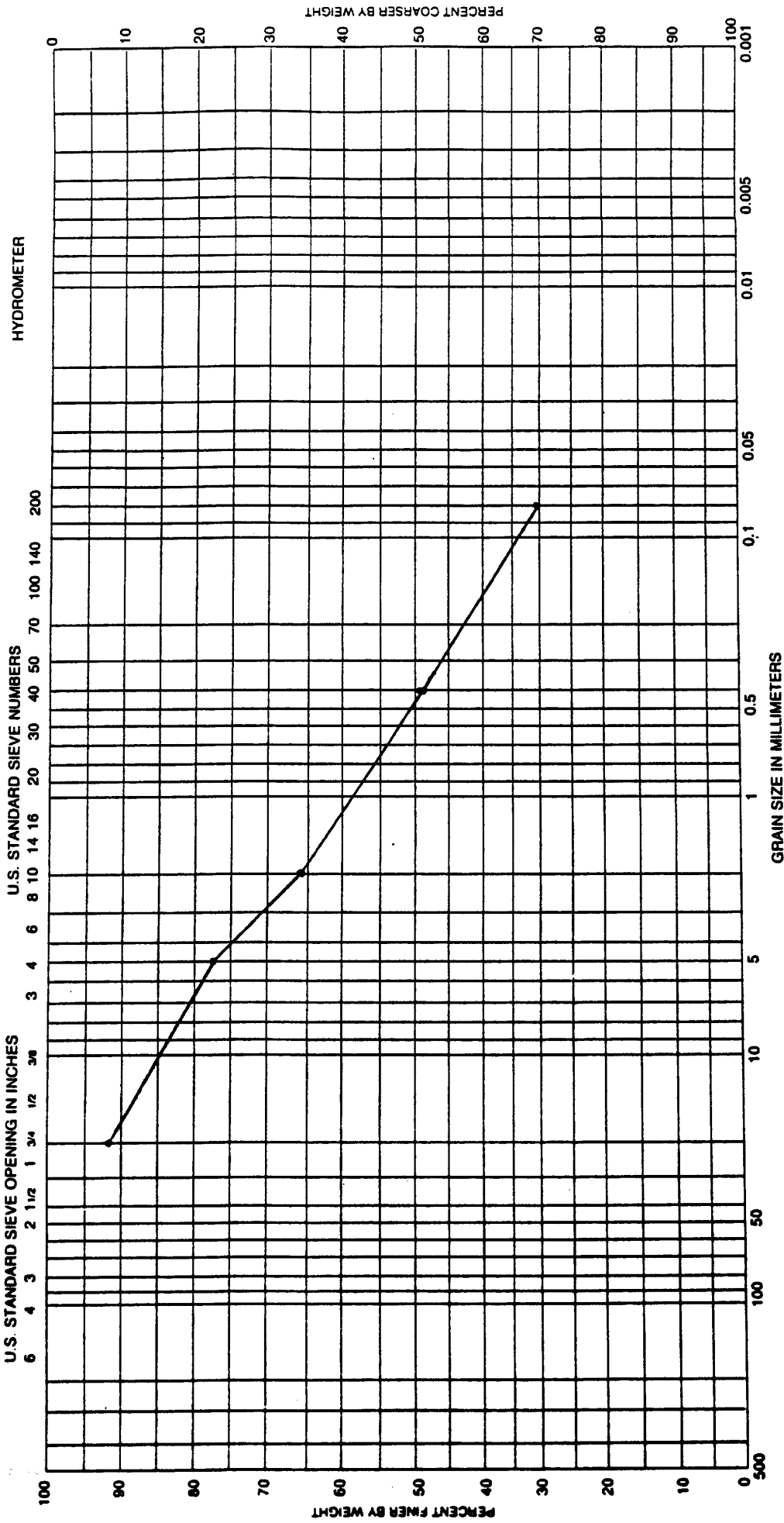


	<b>GRAVEL</b>	<b>SAND</b>	<b>SILT OR CLAY</b>
<b>COBBLES</b>		<b>NEUTRAL</b>	<b>FINE</b>
<b>Sample No.</b>	<b>Elev or Depth</b>	<b>Classification</b>	<b>Net w %</b>
MW-2-12	55'	Sandy Clay: Reddish Tan With Calcareous Nodules (10%) Stiff Dry (CL)	34
<b>PI</b>	<b>PL</b>	<b>LL</b>	<b>PI</b>
12	22	34	12
<b>Project</b>		<b>Amarillo MSW-LF</b>	
<b>Area</b>		<b>Boring No.</b>	
		<b>MW-2</b>	
<b>Date</b>		<b>7-15-94</b>	

GRADATION CURVES

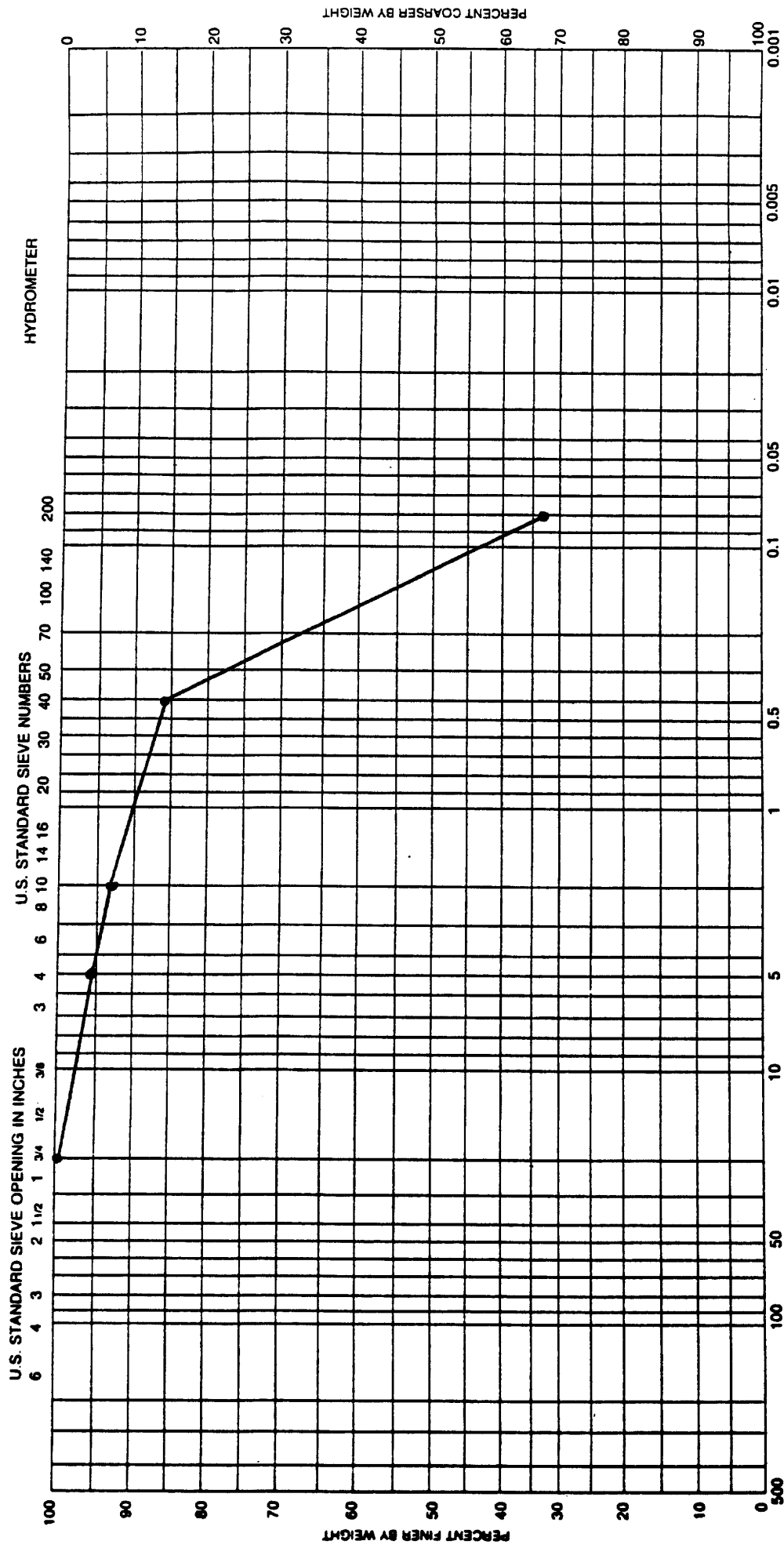


COBBLES	GRAVEL			SAND			SILT OR CLAY		
	COARSE	FINE	COARSE	NEUTRAL	FINE	COARSE	NEUTRAL	FINE	
	Classification:						Net w %	LL	PL
Sample No.	Caliche: Light Tan Limestone Layers, Fractures, Hard (CL)						31	17	14
Elev or Depth	75'								
MW-2-16	Project Amarillo MSWLF								
						Area			
						Boring No.	MW-2		
						Date	7-15-94		
<b>GRADATION CURVES</b>									

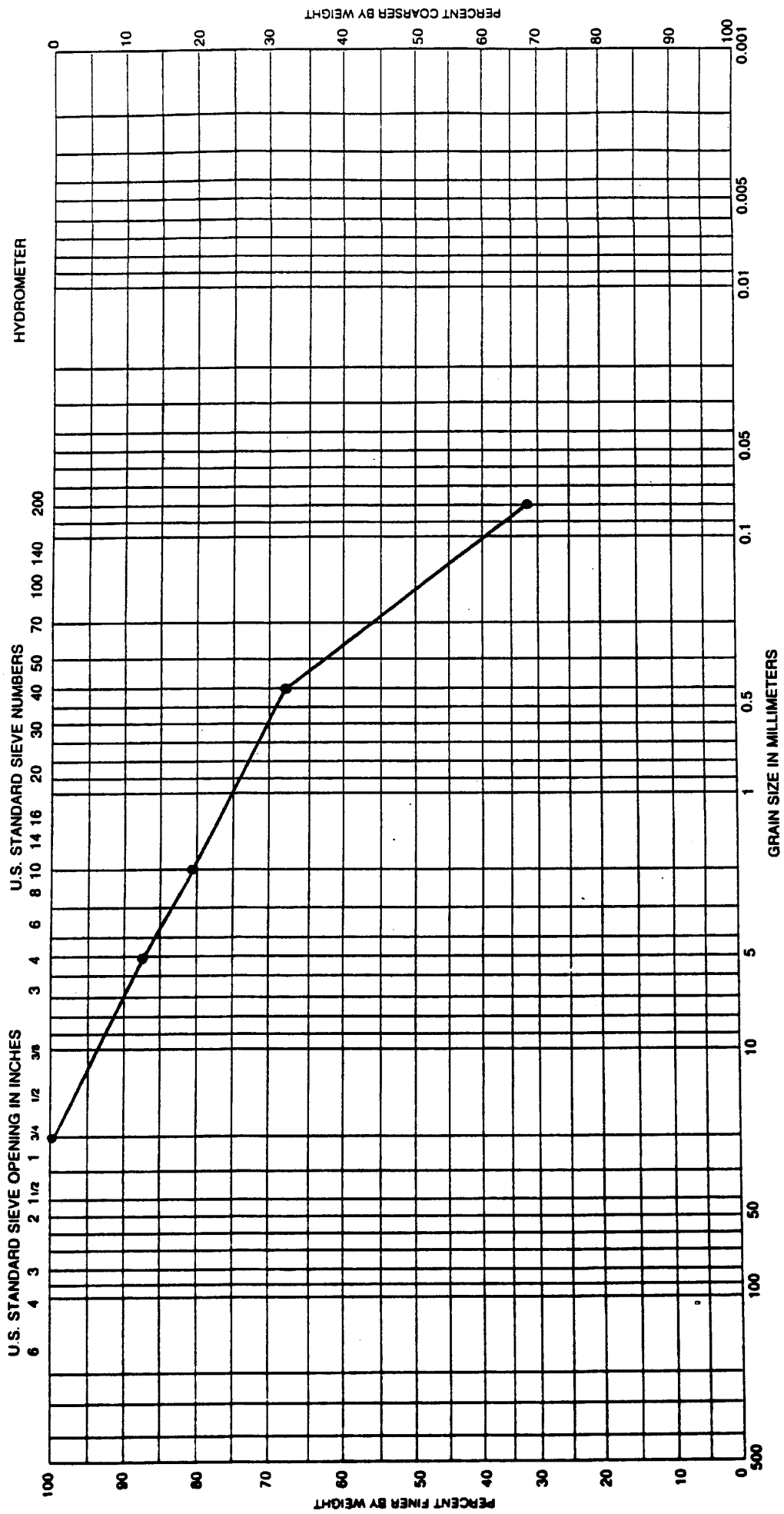


Sample No.	Elev or Depth	Classification				SAND		SILT OR CLAY	
		Net w %	LL	PL	PI	FINE	FINE	Area	Date
MW-2 - 17	80'	Caliche: Light Tan Limestone Layers, Fractures, Hard (CL)	28	18	10			Amarillo MSWLF	

GRADATION CURVES

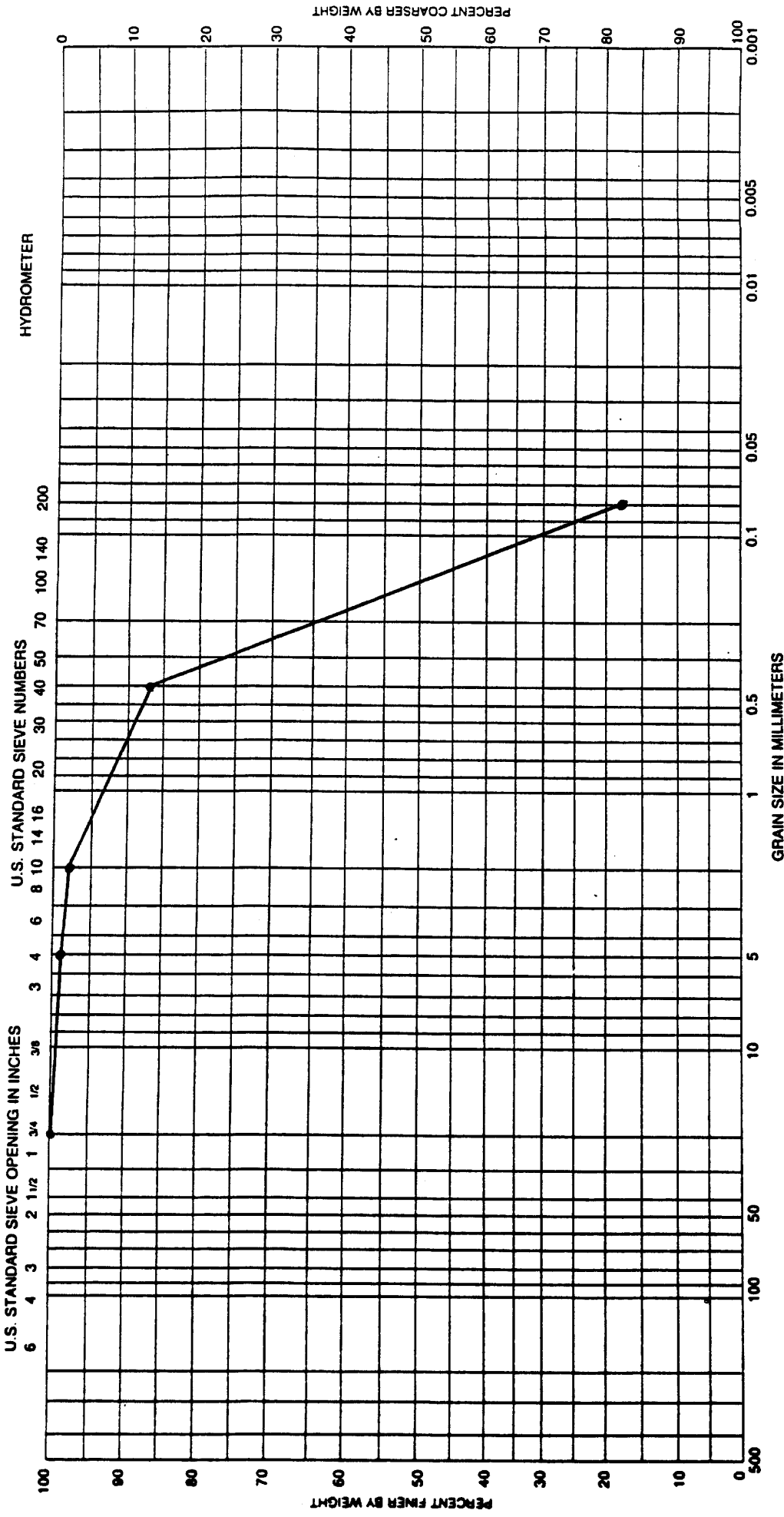


COBBLES		GRAVEL		SAND			SILT OR CLAY		
		COARSE	FINE	NEUTRAL	FINE	PI			
Sample No.	Elev or Depth	Classification						PL	PI
MW-2-19	90'	Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff Dry (SC)						20	7
		Net w %						LL	
								27	
		Project						Amarillo MSW-LF	
		Area							
		Boring No.						MW-2	
		Date						7-15-94	
<b>GRADATION CURVES</b>									



COBBLES		GRAVEL		SAND			SILT OR CLAY	
COARSE		FINE		NEUTRAL		FINE		
Sample No.	Elev or Depth	Classification						Project
MW-2-20	95'	Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff Dry (SC)						Amarillo MSW-LF
		Net w %	LL	PL	PI		Area	
			34	20	14		MW-2	
							Boring No.	
							7-15-94	
							Date	

GRADATION CURVES



Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-2-21	100'	Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff Dry (SG)		21	17	4

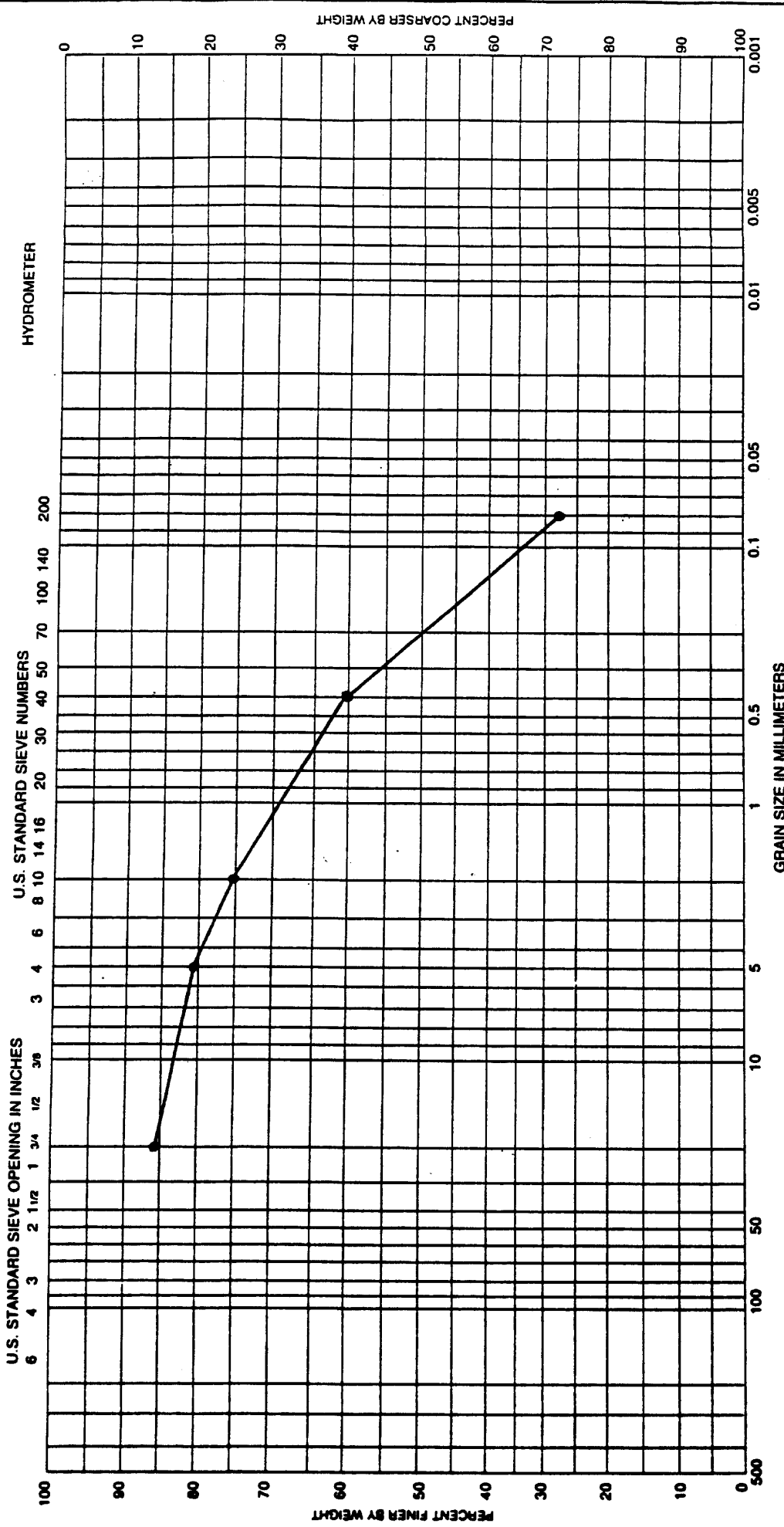
  

COBBLES		GRAVEL		SAND		SILT OR CLAY	
COARSE	FINE	COARSE	FINE	NEUTRAL	FINE		

Project	Amarillo MSW-LF
Area	
Boring No.	MW-2
Date	7-15-94

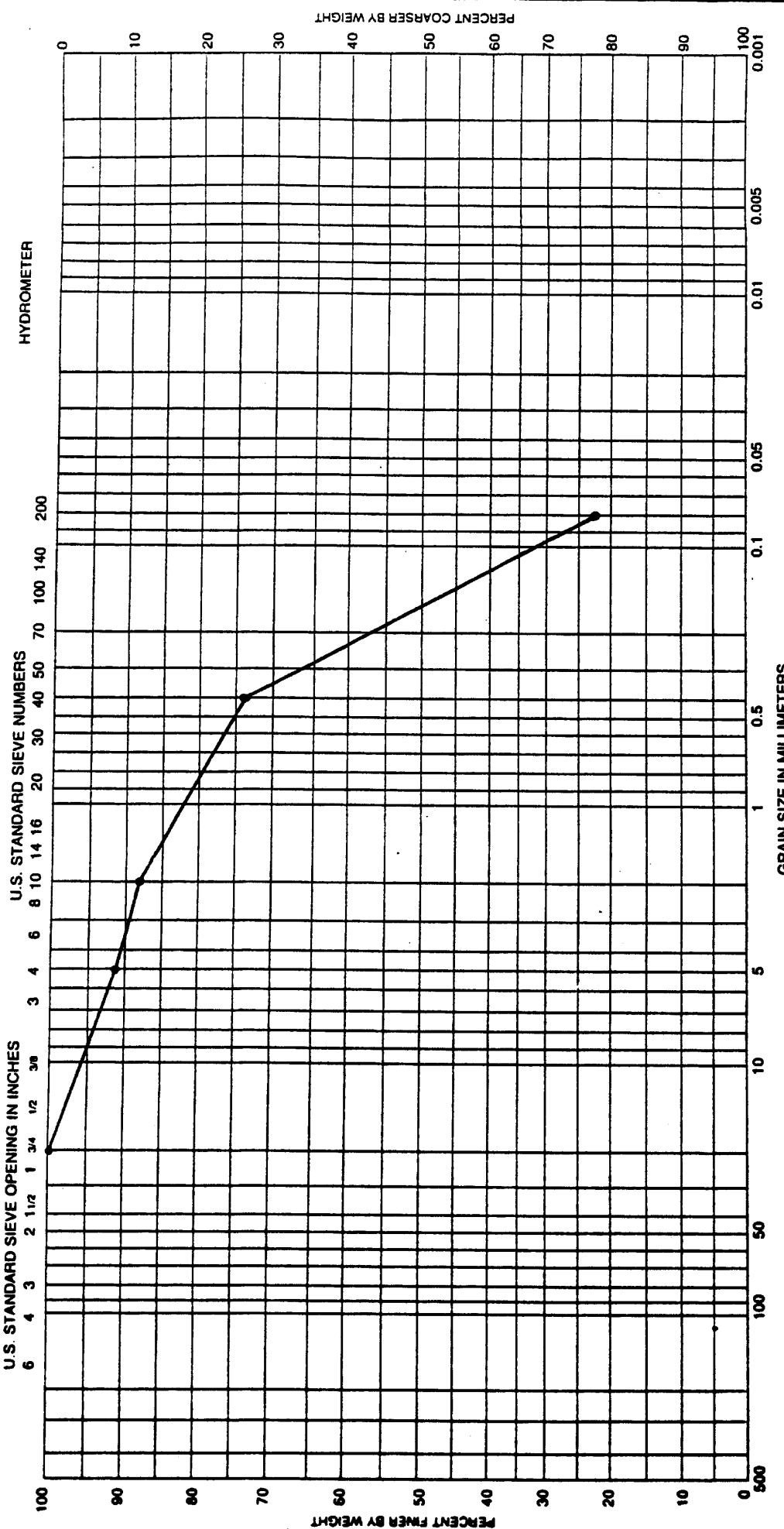
GRADATION CURVES



COBBLES		GRAVEL		SAND			SILT OR CLAY		
		COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI
Sample No.	Elev or Depth	Classification							
MW-2-23	110'	Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff Dry (SC)							
		Net w %	LL	PL	PI				
			22	19	3				
		Project							
		Amarillo MSW-LF							
		Area							
		Boring No.							
		MW-2							
		Date							
		7-15-94							

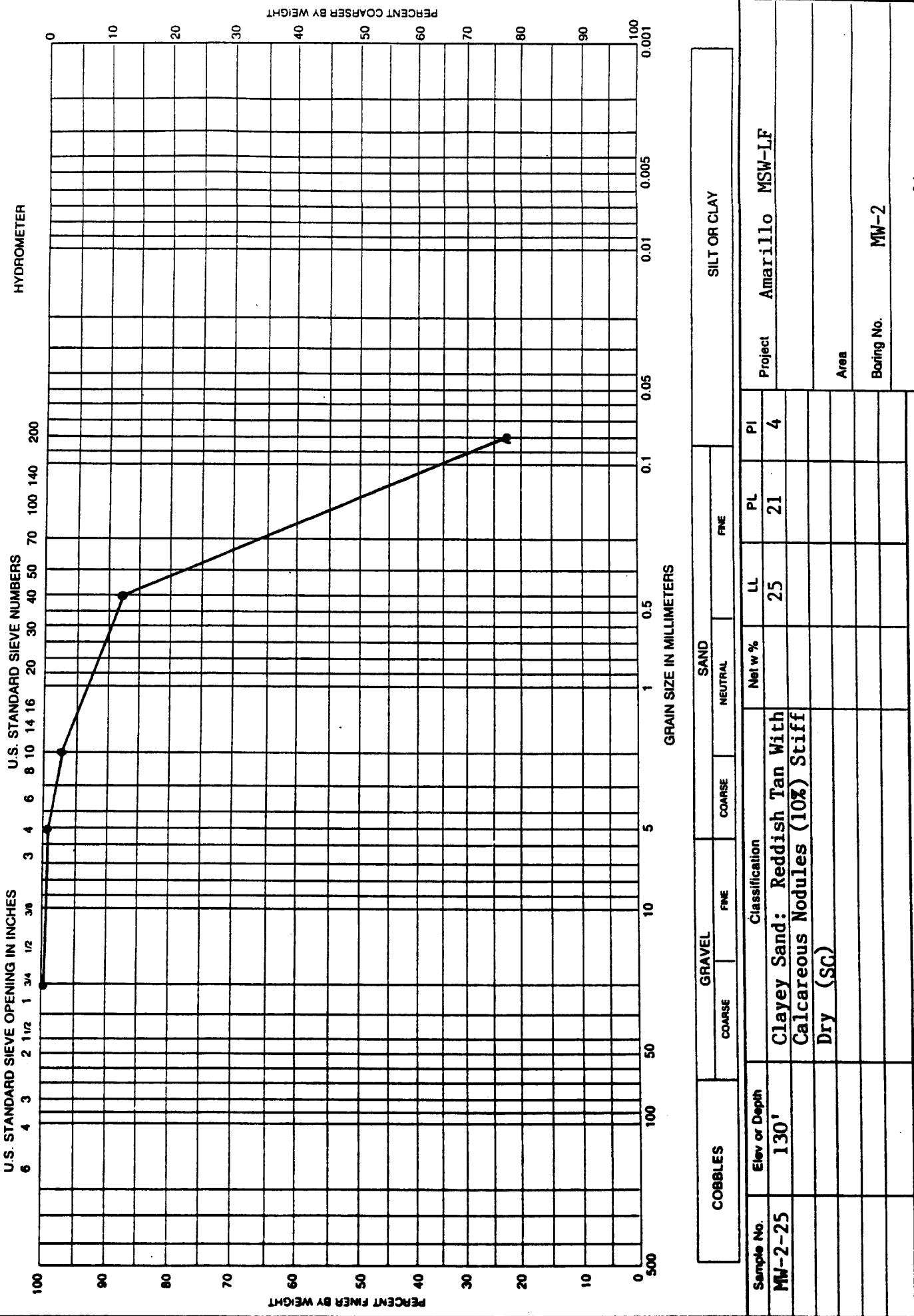
GRADATION CURVES





COBBLES		GRAVEL		SAND			SILT OR CLAY	
Sample No.	Elev or Depth	Classification		Net w %	LL	PL	PI	Project
MW-2-24	120'	Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff Dry (SC)			21	18	3	Amarillo MSW-LF
								Area
								Boring No. MW-2
								Date 7-15-94

GRADATION CURVES



Project **Amarillo MSW-LF**

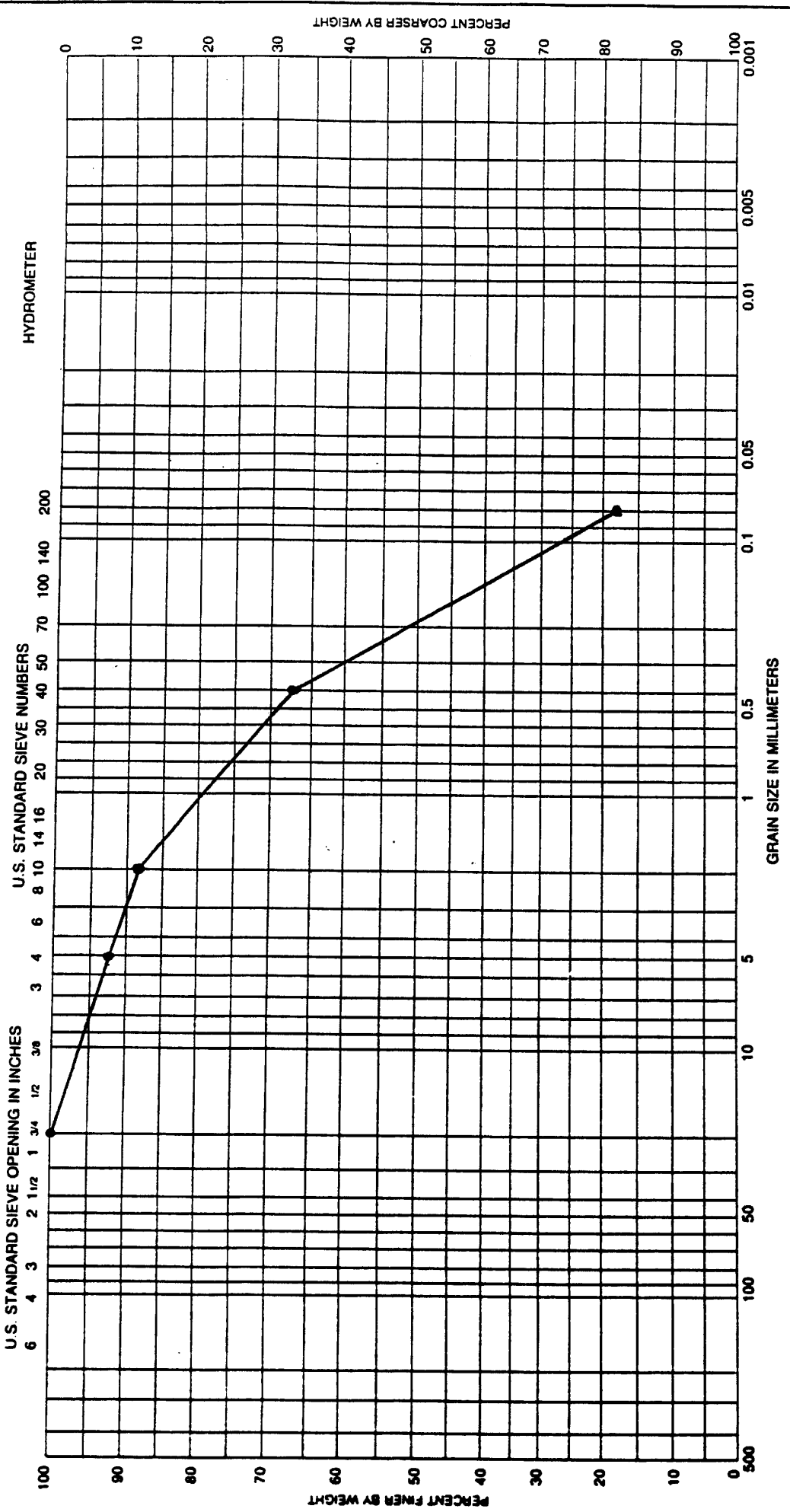
Area \_\_\_\_\_

Boring No. **MW-2**

Date **7-15-94**

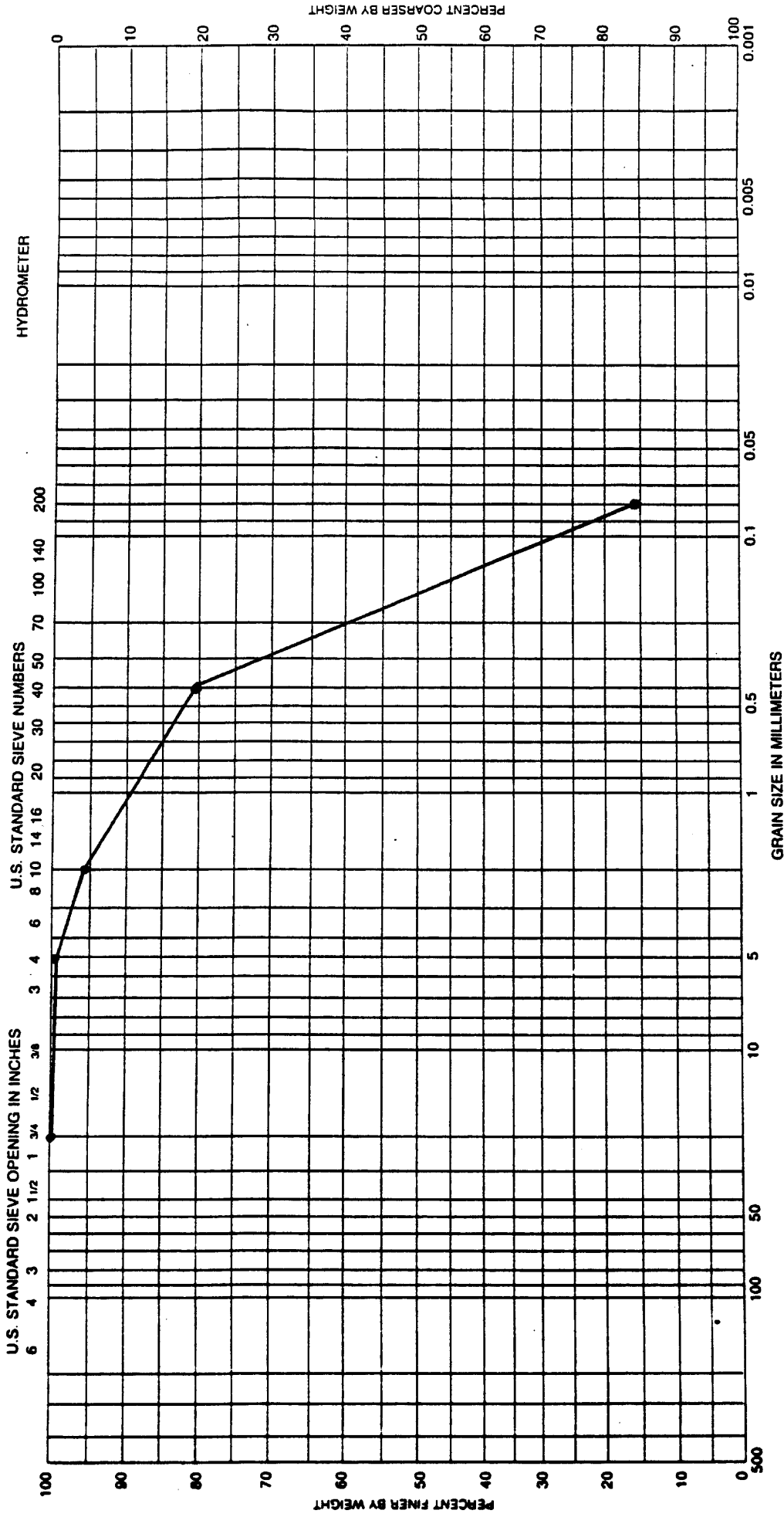
Sample No.	Elev or Depth	Classification	SAND			GRAVEL		PI
			Net w %	LL	PL	COARSE	FINE	
<b>MM-2-25</b>	<b>130'</b>	<b>Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff Dry (SG)</b>	<b>25</b>	<b>25</b>	<b>21</b>		<b>4</b>	

**GRADATION CURVES**

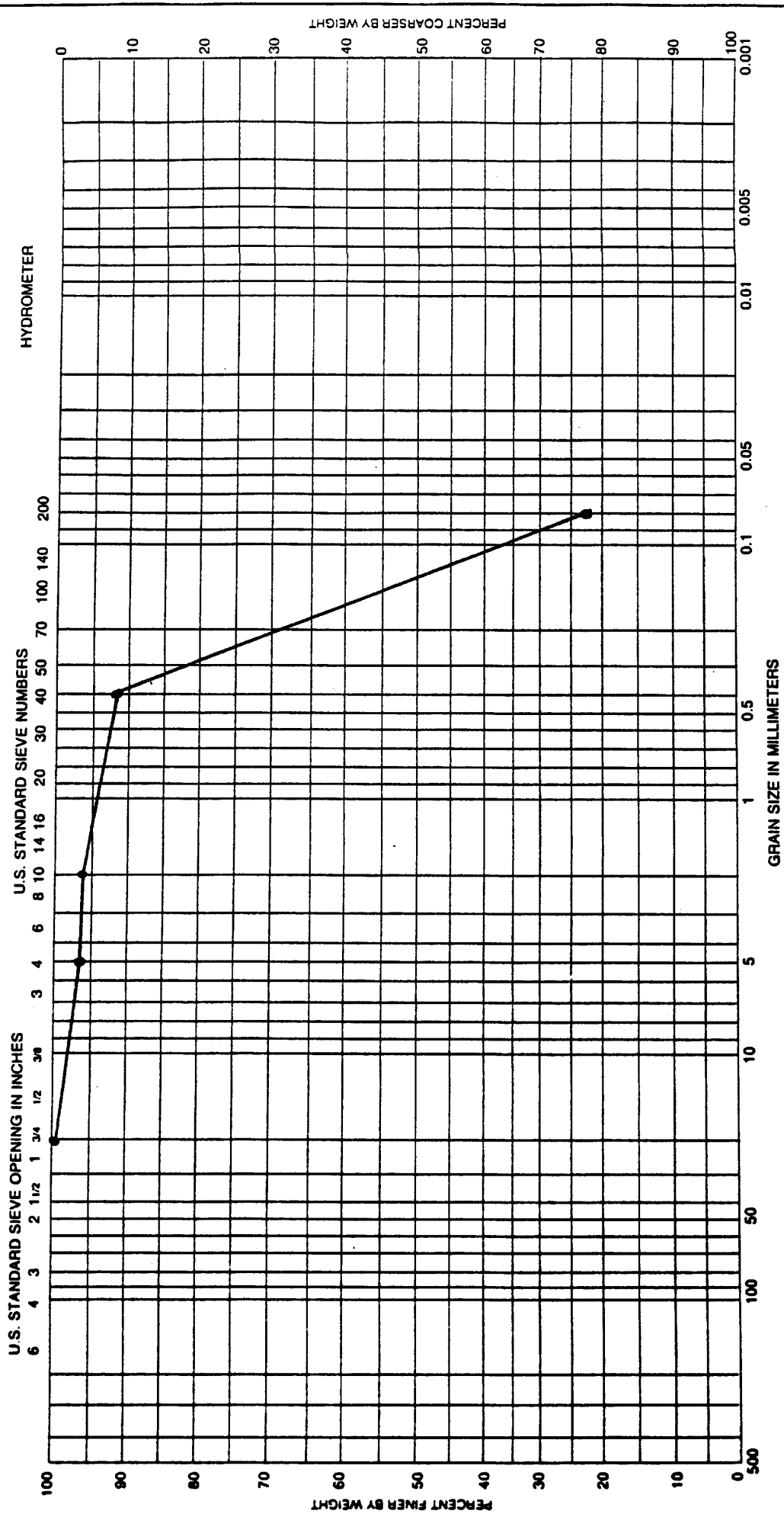


Sample No.	Elev or Depth	Classification	GRAVEL			SAND			PI	Project
			COARSE	FINE	COARSE	NEUTRAL	FINE	MSW-LF		
MW-2-26	140'	Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff Dry (SC)			24		20	4	Amarillo	
									Area	
									Boring No. MW-2	
									Date 7-15-94	

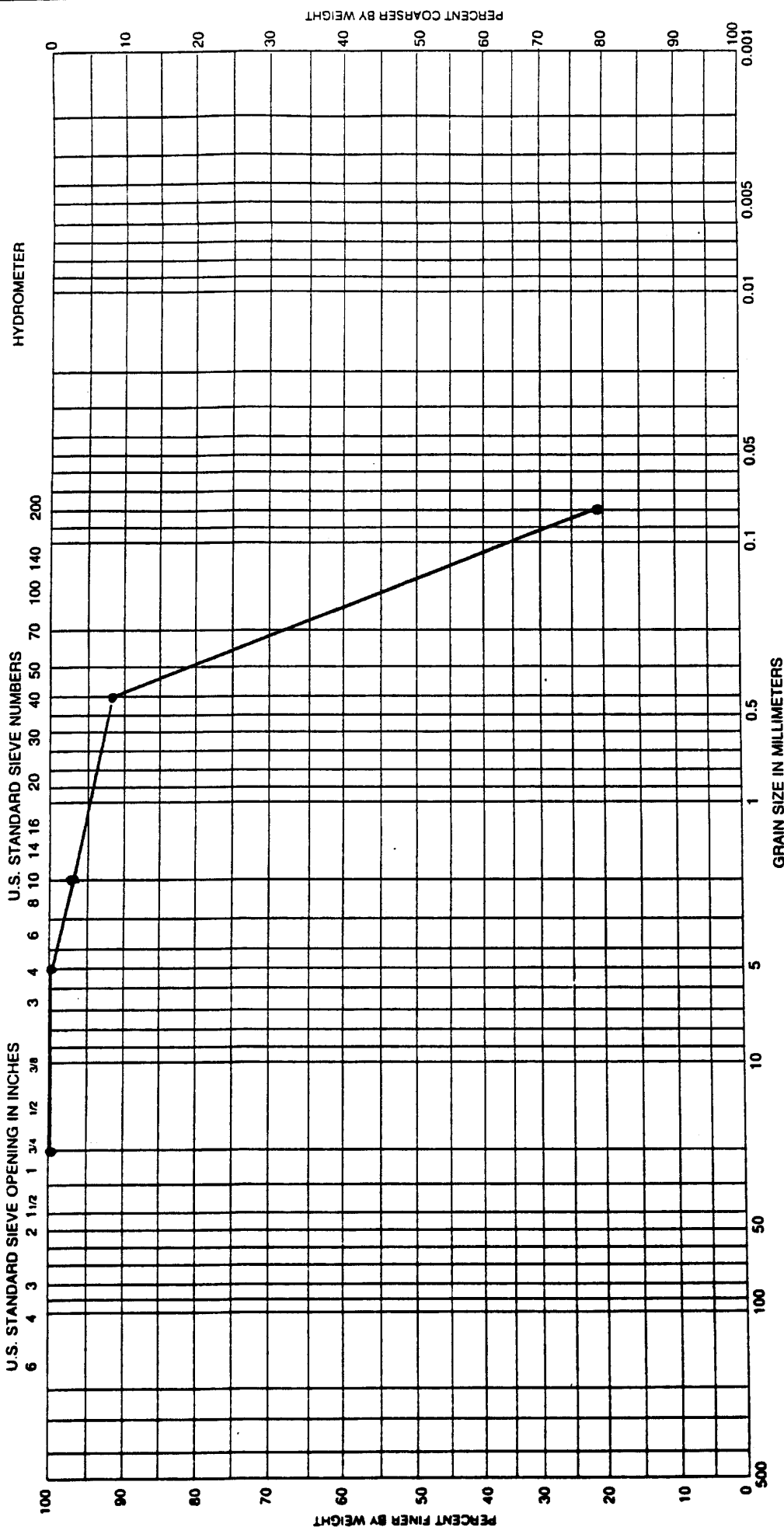
GRADATION CURVES



	COBBLES	GRAVEL COARSE      FINE	SAND NEUTRAL      FINE	SILT OR CLAY
Sample No.	Classification			
MM-2 - 27	Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff Dry (SC)			
Elev or Depth	150'			
Project	Amarillo MSW-LF			
Area				
Boring No.	MM-2			
Date	7-15-94			
<b>GRADATION CURVES</b>				



COBBLES	GRAVEL		SAND		SILT OR CLAY			
	COARSE	FINE	COARSE	NEUTRAL	FINE			
Sample No.	Elev or Depth	Classification			Net w %	LL	PL	PI
MW-2-28	160'	Clayey Sand: Reddish Tan With Calcareous Nodules (10%) Stiff Dry (SC)						NP
Project					Amarillo MSW-LF			
Boring No.					MW-2			
Date					7-15-94			
GRADATION CURVES								



COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	NEUTRAL	FINE		
Sample No.	Elev or Depth	Classification				Project	MSW-1F
MW-2-29	170'	Clayey Sand: Reddish Tan With Calcareous Nodules (15%) Stiff Dry (SQ)					Amarillo
						Area	
						Boring No.	MW-2
						PI	NP
						PL	
						LL	
						Net w %	
GRADATION CURVES							
						Date	7-15-94

**LOG OF BORING**

**MW - 3**





## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-3  
 LOCATION: Amarillo, Texas

Date: 7-19-94 thru 7-26-94

Ground Elevation: 3789.57'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary										
			SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO 200 SIEVE			
GROUNDWATER INFORMATION:(Continuous Core) Auger Drilled to 70' Groundwater encountered at 200'			DESCRIPTION OF STRATUM										
30													
-35-				8.2			32	70	12				72.9
			Sandy Clay: Reddish Tan with Scattered Calcareous Nodules Stiff, Dry (CL)										
-40-													
-45-			K = $3.45 \times 10^{-5}$ cm/sec (R)										
-50-													
-55-													
-60-													

Continued on Page 3

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-3  
 LOCATION: Amarillo, Texas

Date: 7-19-94 thru 7-26-94

Ground Elevation: 3789.57'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS/FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: (Continuous Core) Auger Drilled to 70' Groundwater encountered at 200'									
			DESCRIPTION OF STRATUM									
60	•••••		Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Stiff, Dry (SC)									
65	•••••											
70	•••••											
75	•••••	X	21-6"	MD		26	19	7				34.7
	•••••	X	46-12"									
	•••••	X	50-13"									
80	•••••	X	50-1"	MD								
	•••••	X										
85	•••••	X	50-3"	MD								
	•••••	X										
90	•••••	X										

Continued on Page 4

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-3  
 LOCATION: Amarillo, Texas

Date: 7-19-94 thru 7-26-94

Ground Elevation: 3789.57'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE	
			GROUNDWATER INFORMATION (Continuous Core) Auger Drilled to 70' Groundwater encountered at 200'										
DESCRIPTION OF STRATUM													
90	•••	X	Clayey Sand: Light Tan with Scattered Calcareous Nodules, Stiff (SC)		50-6"	MD		25	18	7		31.9	
95	•••	X			50-4"	MD		26	19	7		30.8	
100	•••	X			50-5"	MD		21	16	5		7	
105	•••	X											
110	•••	X	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules, Stiff (SC)		34-6"	MD		23	19	4		28.1	
	•••	X			50-8"								
115	•••	X											
120	•••	X											

Continued on Page 5

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-3  
 LOCATION: Amarillo, Texas

Date: 7-19-94 thru 7-26-94

Ground Elevation: 3789.57'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: (Continuous Core) Auger Drilled to 70'									
			Groundwater encountered at 200'		DESCRIPTION OF STRATUM							
120	X				38-6"	MD		19	16	3		21.8
					50-7"							
125												
130	X				38-6"	MD		22	19	3		22.6
					50-7.5"							
135												
140	X				50-5"	MD		19	16	3		17.0
145												
150												

Clayey Sand: Reddish Tan with Scattered Calcareous Nodules, Stiff (SC)

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-3  
 LOCATION: Amarillo, Texas

Date: 7-19-94 thru 7-26-94

Ground Elevation: 3789.57'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: (Continuous Core) Auger Drilled to 70' Groundwater encountered at 200'									
			DESCRIPTION OF STRATUM									
150	X	X	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Stiff (SC)									
155												
160	X	X										
165												
170	X	X										
175												
180												
			50-6"	MD		19	16	3		15.7		
			50-4"	MD		18	16	2		2'		
			50-4"	MD		19	17	2		20.1		
			Tan Sand: Well Sorted with Calcareous Nodules (SC)									
			Continued on Page 7									

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-3  
 LOCATION: Amarillo, Texas

Date: 7-19-94 thru 7-26-94

Ground Elevation: 3789.57'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary									
			GROUNDWATER INFORMATION: (Continuous Core) Auger Drilled to 70' Groundwater encountered at 200'									
DESCRIPTION OF STRATUM			SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE		
180	▣	X	50-4.5"	MD				NP		12.6		
185	▣											
190	▣	X	50-5"	MD				NP		13.0		
195	▣											
200	▣	X	50-6"	MD				NP		14.1		
205	▣											
210	▣											

Continued on Page 8

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-3  
 LOCATION: Amarillo, Texas

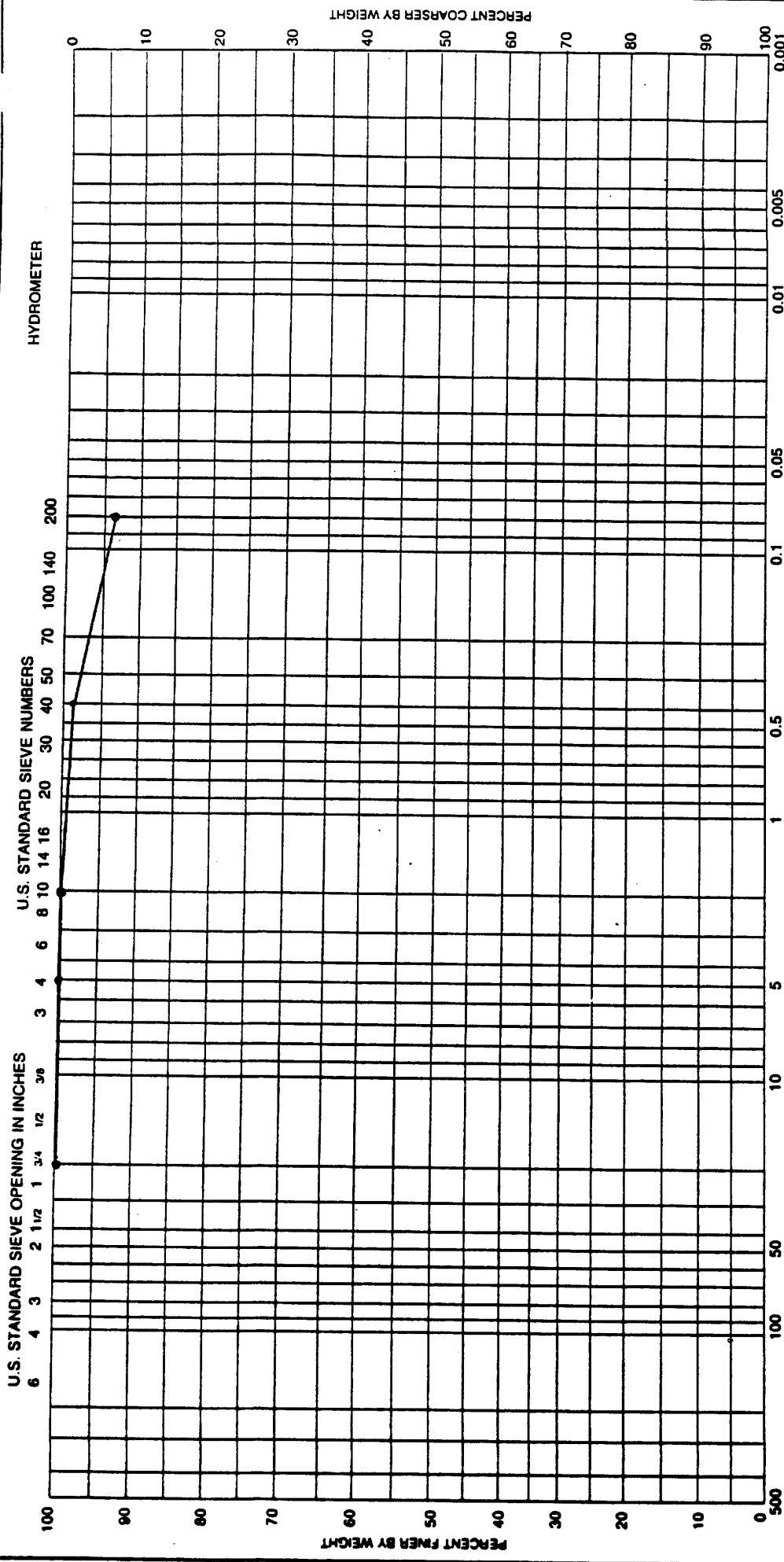
Date: 7-19-94 thru 7-26-94

Ground Elevation: 3789.57'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary								
			SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE	
GROUNDWATER INFORMATION: (Continuous Core) Auger Drilled to 70'											
Groundwater encountered at 200'											
DESCRIPTION OF STRATUM											
210	•••	X	50-5"	MD					NP		14.9
215	•••										
220	•••	X	50-4"	MD					NP		23
225	•••										
230	•••	X	50-5.5"	MD					NP		
235	•••		Clayey Sand: Tan with Scattered Calcareous Nodules, Stiff (SC)								
	•••										
	•••										
	•••										
240	•••		Continued on Page 9								

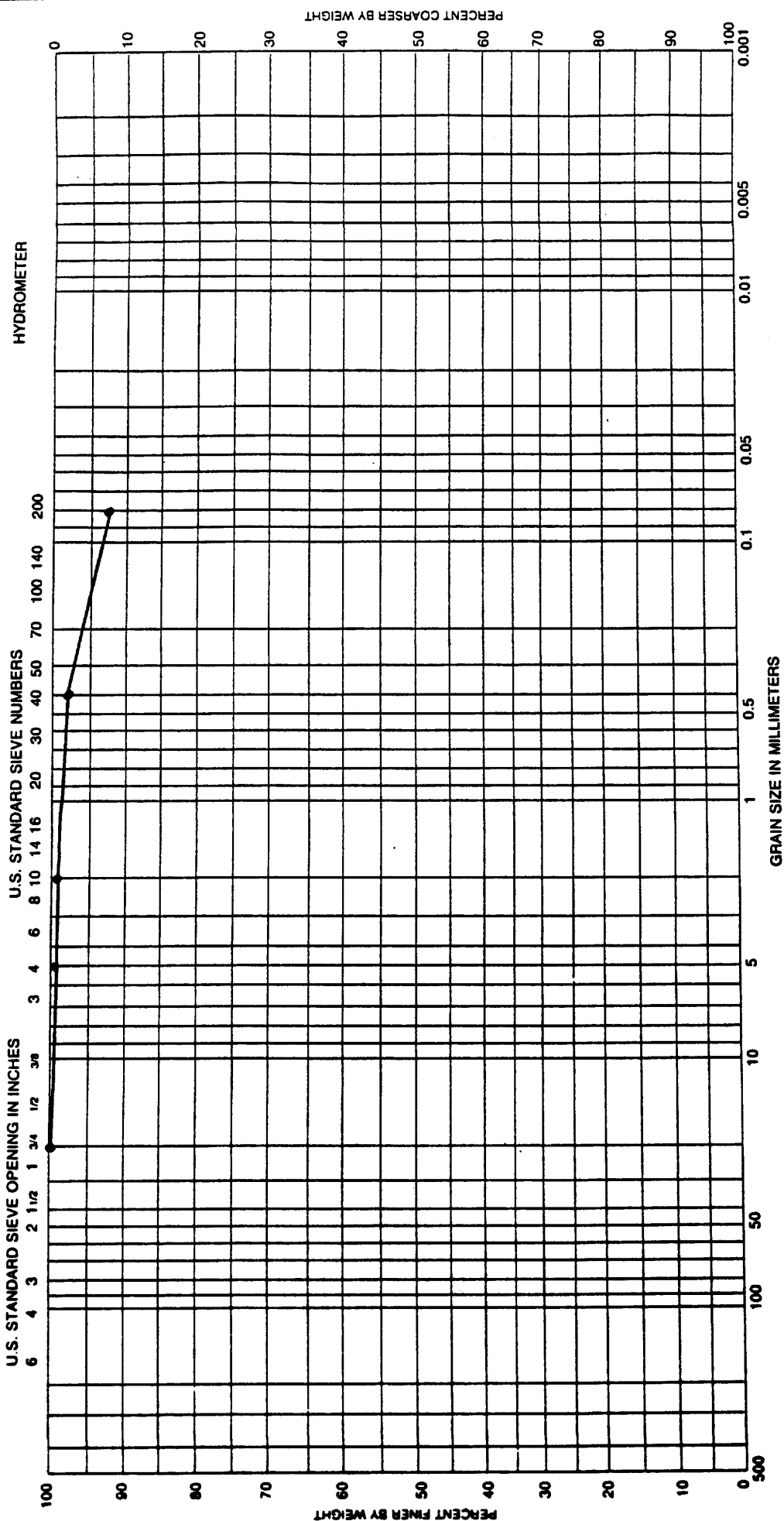






Sample No.	Elev or Depth	Classification	SAND			PI	Project	Area	Boring No.	Date
			Net w %	LL	PL					
MW-3 - 1	0 - 2'	Sandy Clay; Brown Stiff, Dry (CL) (R)		33	14	19	Amarillo	MSW-LF	MW-3	7-19-94

GRADATION CURVES



Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-3 - 2	5'	Sandy Clay: Reddish Brown With Scattered Calcareous Nodules, Stiff, Dry (CL)		32	15	17

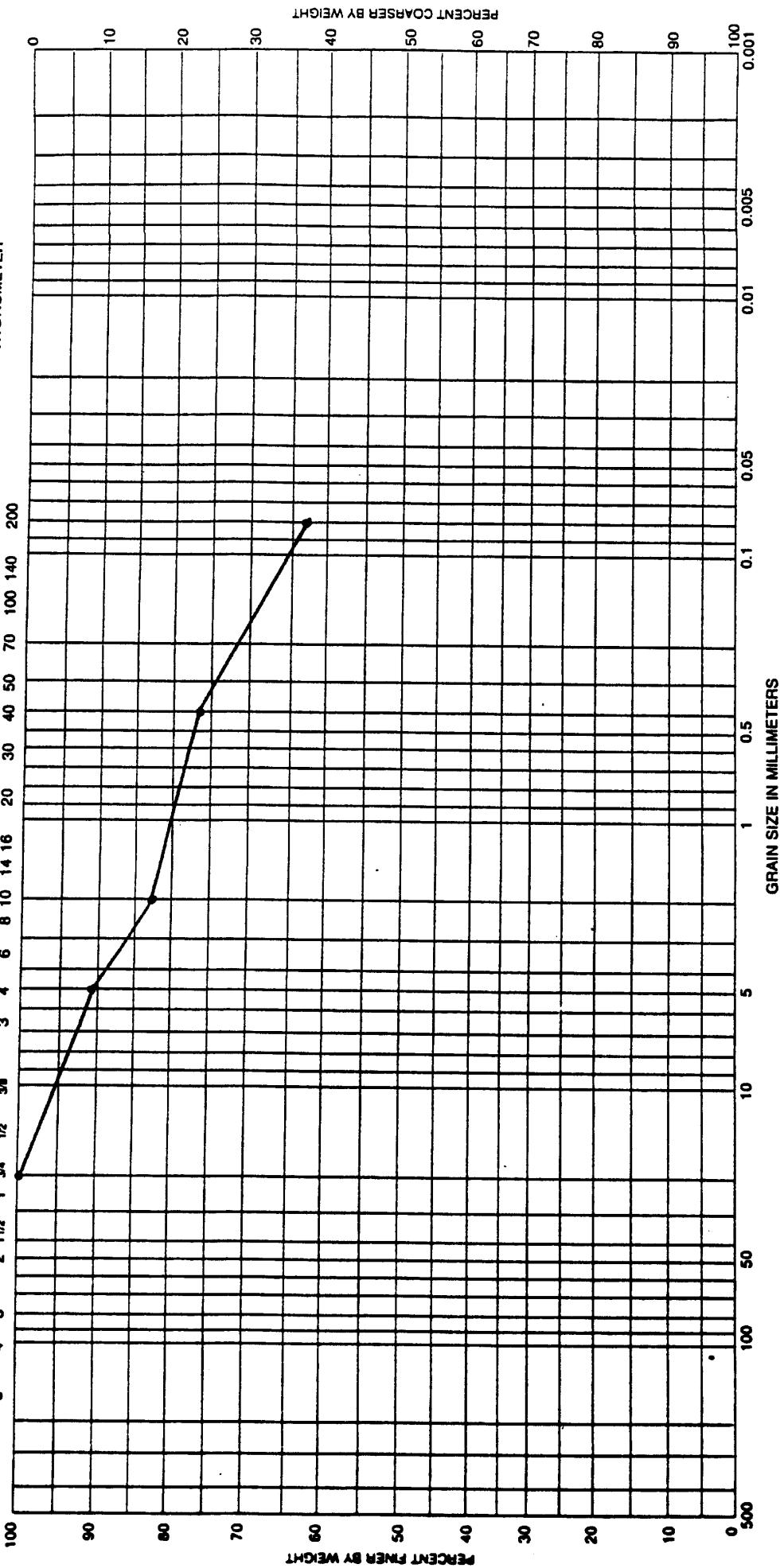
Project	Amarillo	MSW-LF
Area		
Boring No.	MW-3	
Date	7-19-94	

GRADATION CURVES

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

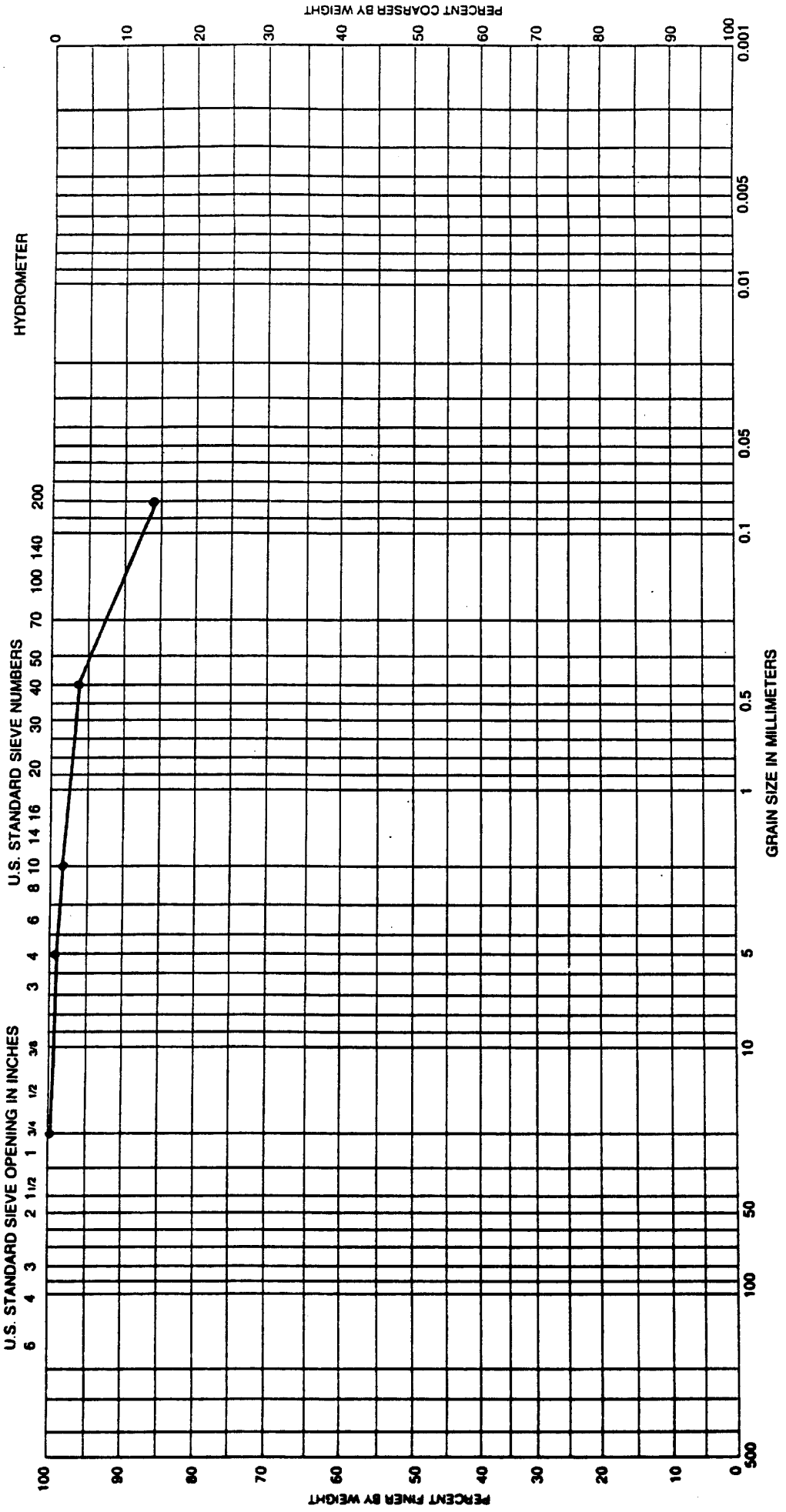
HYDROMETER



PERCENT COARSER BY WEIGHT

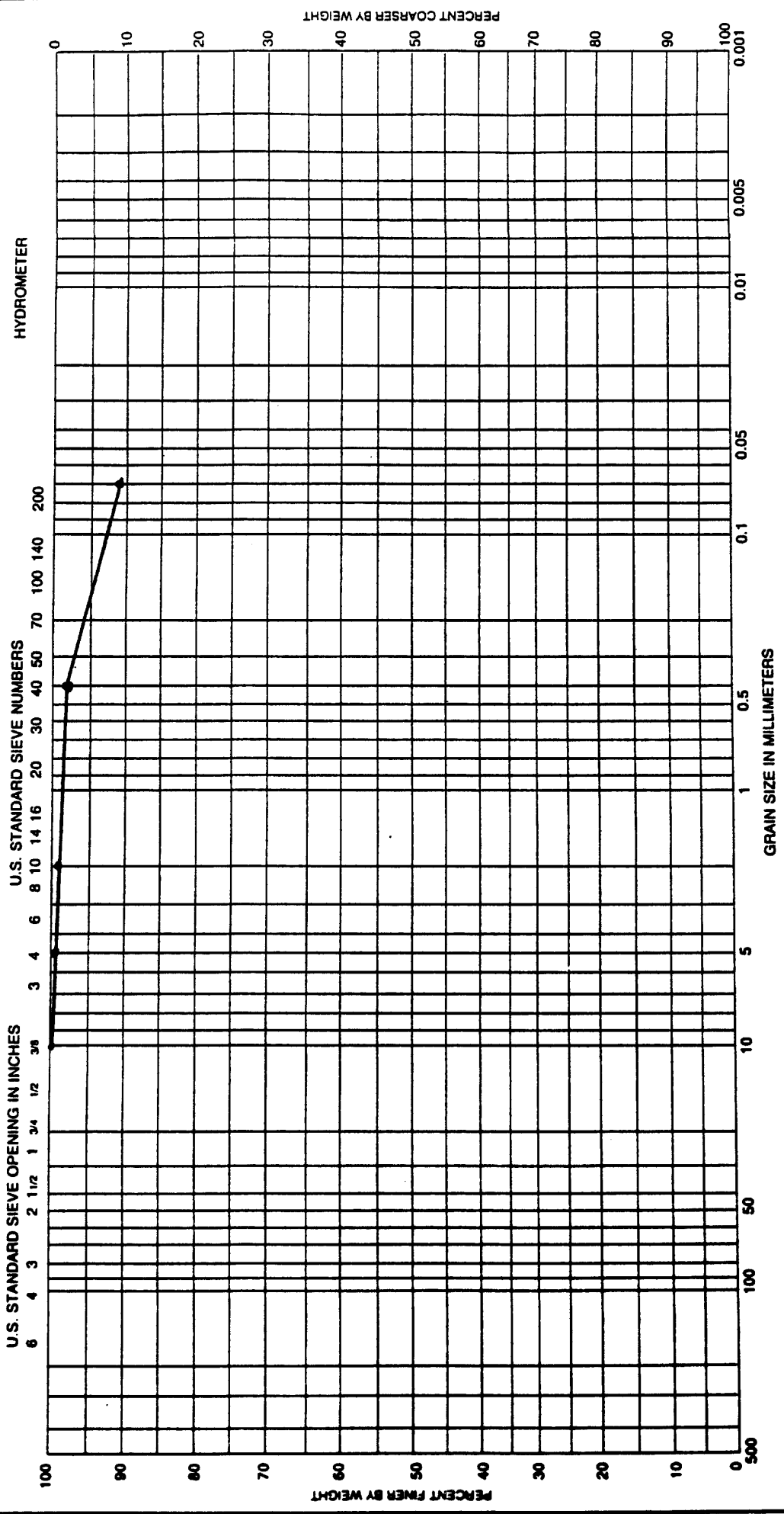
Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MM-3 - 3	10'	Sandy Clay; Tan With a Caliche Stringer (CL)	21	8	13	
Project: Amarillo MSW-LF						
Area: _____						
Boring No.: MW-3						
Date: 7-19-94						

GRADATION CURVES



COBBLES		GRAVEL		SAND			SILT OR CLAY	
Sample No.	Elev or Depth	COARSE	FINE	COARSE	NEUTRAL	FINE	PI	PL
MM-3 - 4	15'						32	16
Classification								
Sandy Clay; Reddish Tan								
With Scattered Calcareous								
Nodules, Stiff, Dry (CL)								
Project: Amarillo MSW-LF								
Area: MW-3								
Boring No.:								
Date: 7-19-94								

GRADATION CURVES



Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-3 - 5	20'	Sandy Clay; Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (CL)	31	14	17	

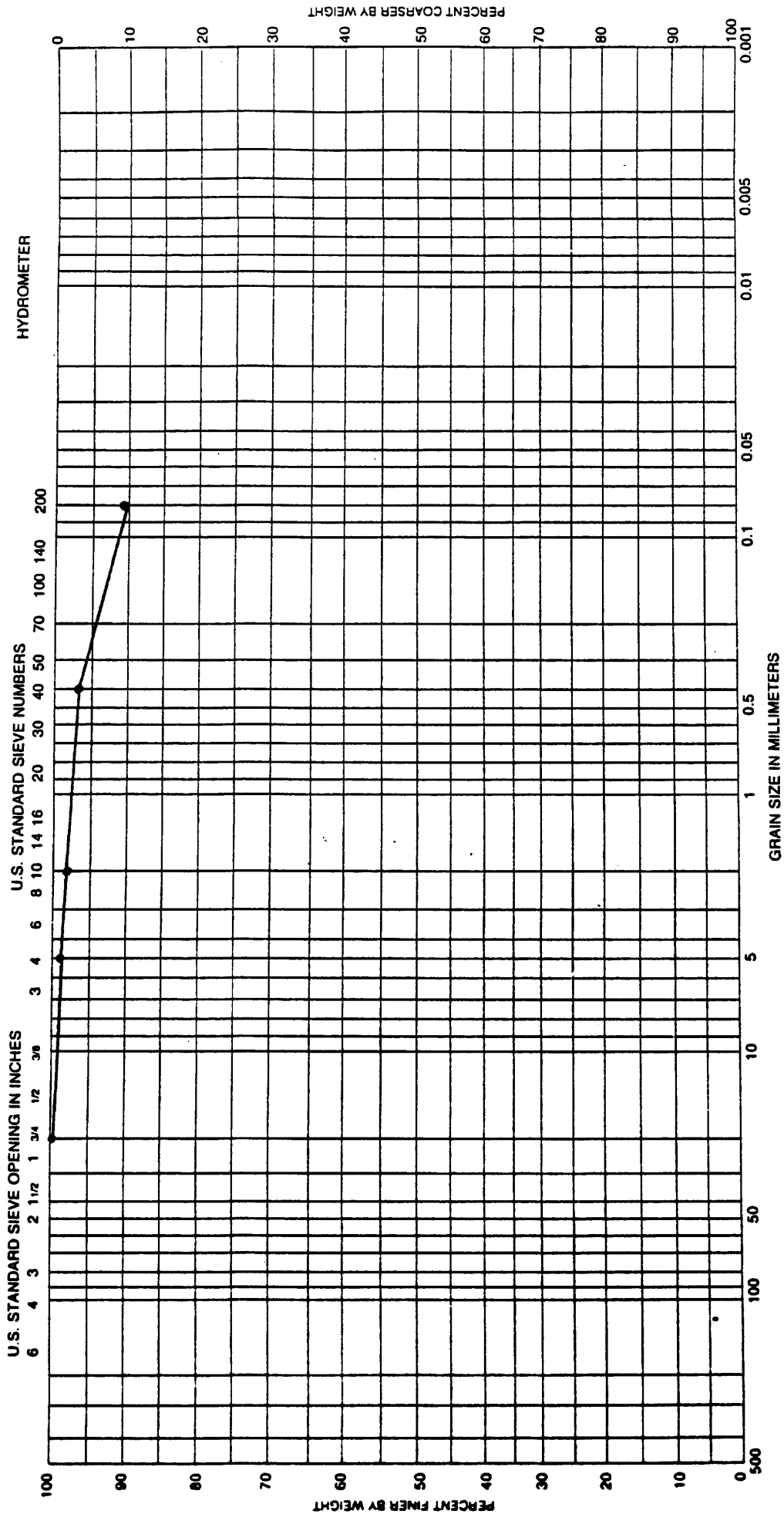
  

COBBLES		GRAVEL		SAND		SILT OR CLAY	
COARSE	FINE	COARSE	FINE	NEUTRAL	FINE	PL	PI

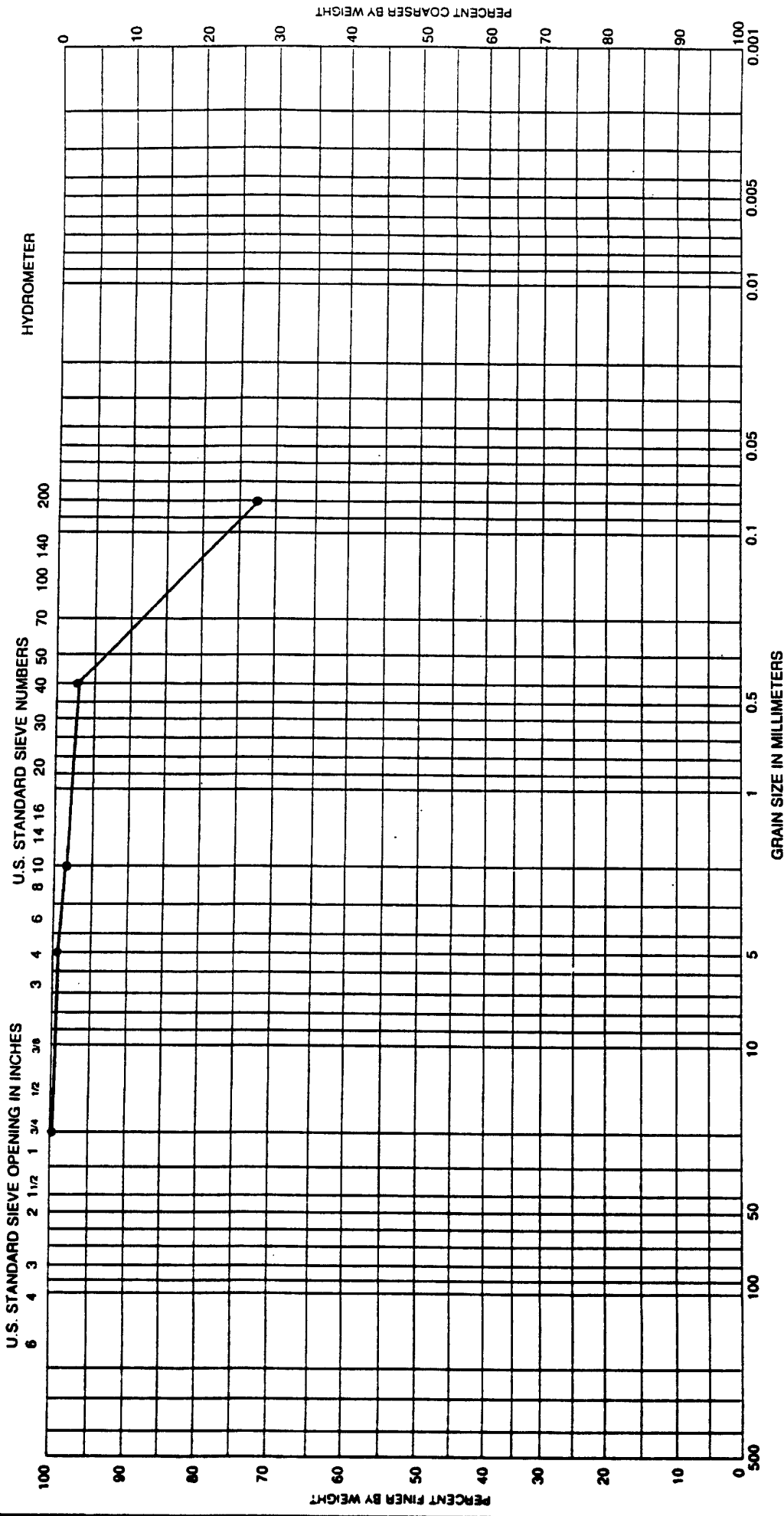
Project	Amarillo	MSW-LF
Area		
Boring No.	MW-3	
Date	7-19-94	

**GRADATION CURVES**

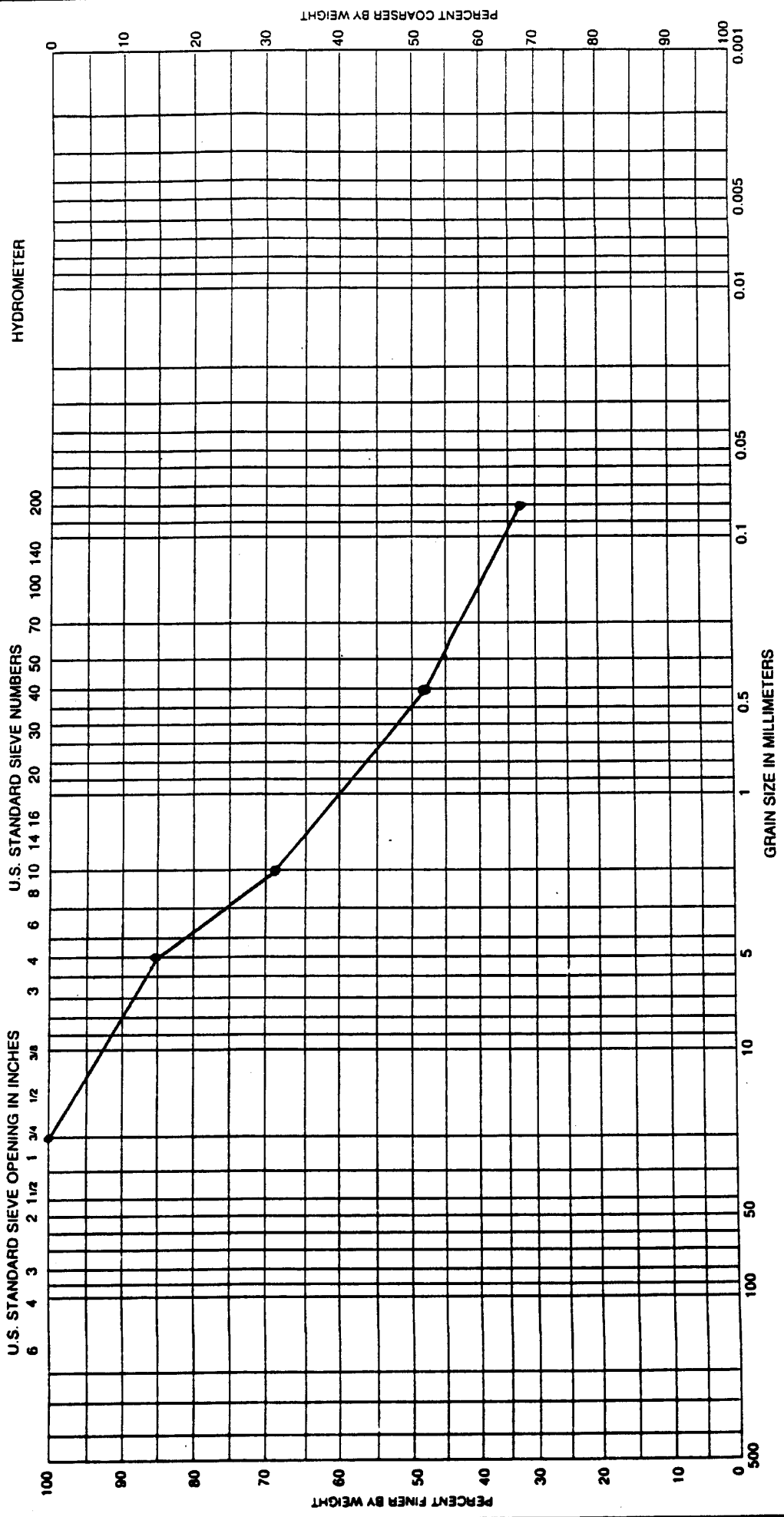


COBBLES		GRAVEL		SAND			SILT OR CLAY					
		COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI			
Sample No.	Elev or Depth	Classification								Project	Amarillo	MSW-LF
MW-3 - 6	25'	Sandy Clay: Tan With Caliche Stringers (CL)								Net w %	31	15
										LL	31	16
										PL		
										PI		
										Area	MW-3	
										Boring No.		
										Date	7-19-94	

**GRADATION CURVES**

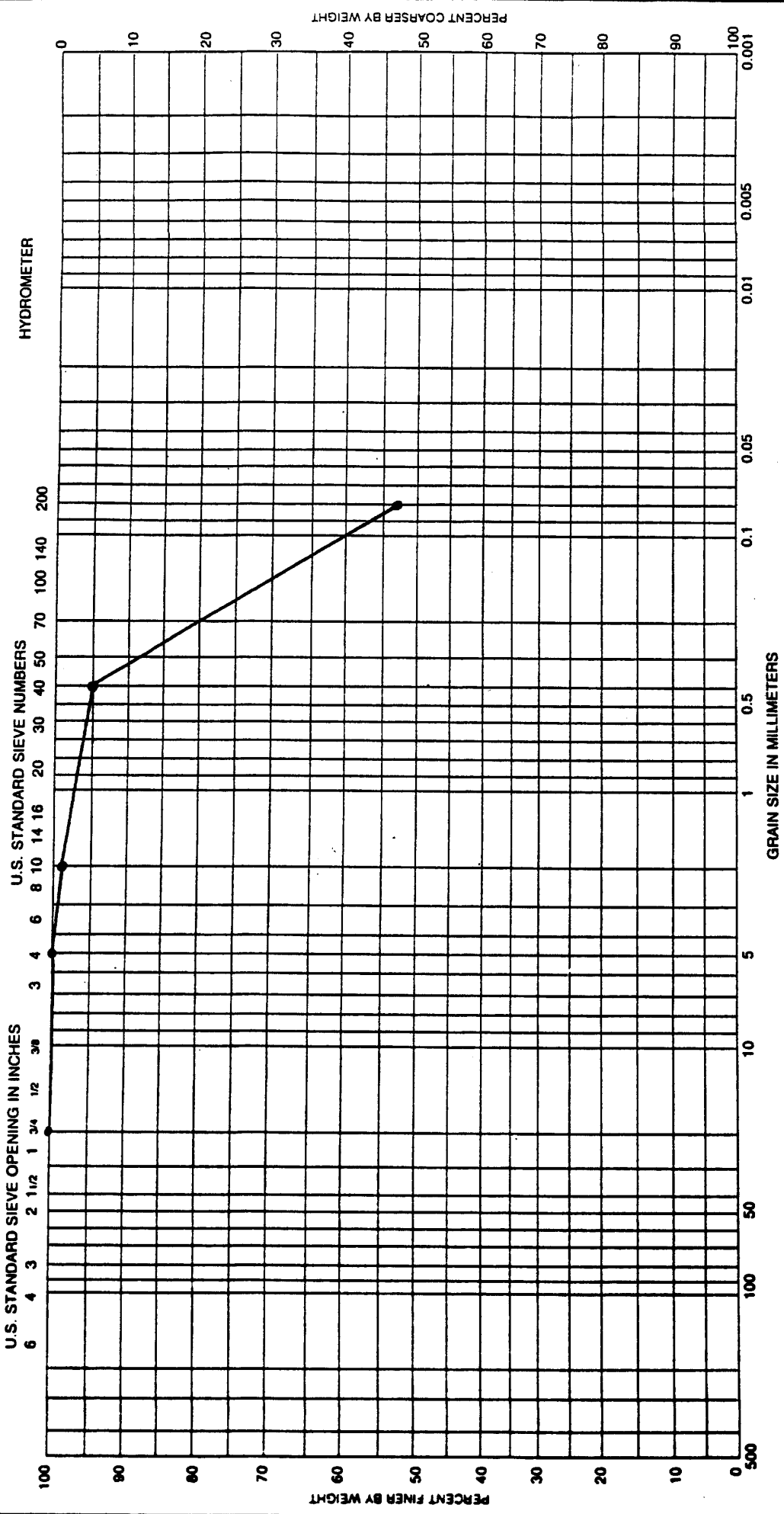


Sample No.	Elev or Depth	Classification	SAND			GRAVEL		SILT OR CLAY		Project	Area	Boring No.	Date
			Net w %	LL	PL	PI	COARSE	FINE	COARSE				
MW-3 - 9	40'	Sandy Clay; Reddish Tan With Scattered Calcareous Nodules. Stiff. Dry (CL)								Amarillo	MSW-LF	MW-3	7-19-94
<b>GRADATION CURVES</b>													

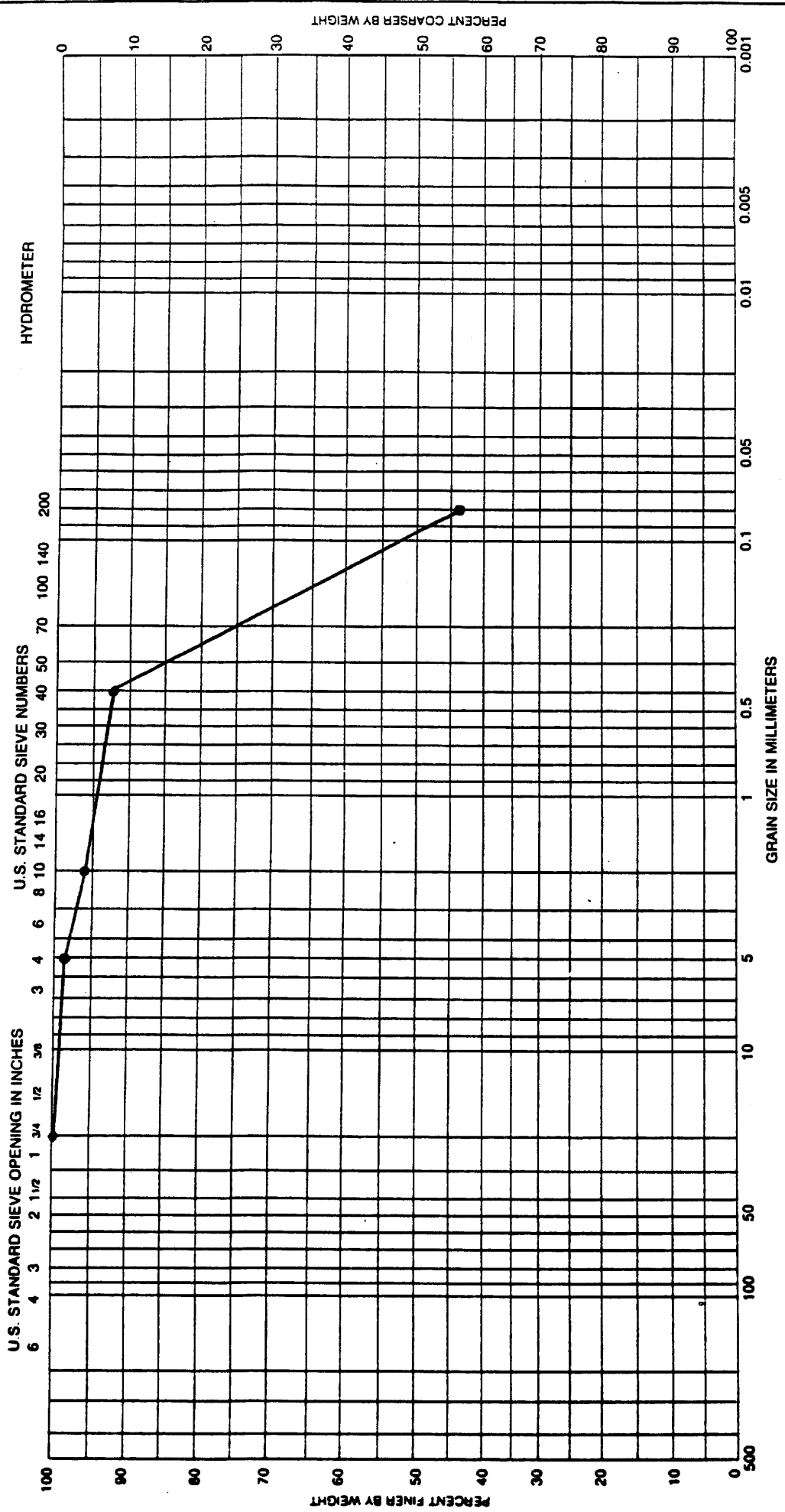


COBBLES		GRAVEL		SAND			SILT OR CLAY		
		COARSE	FINE	COARSE	NEUTRAL	FINE			
Sample No.	Elev or Depth	Classification						Project	Amarillo MSW-LF
MW-3 - 13	60'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)						PI	10
								PL	20
								LL	30
								Net w %	
								Area	MW-3
								Boring No.	
								Date	7-19-94
<b>GRADATION CURVES</b>									

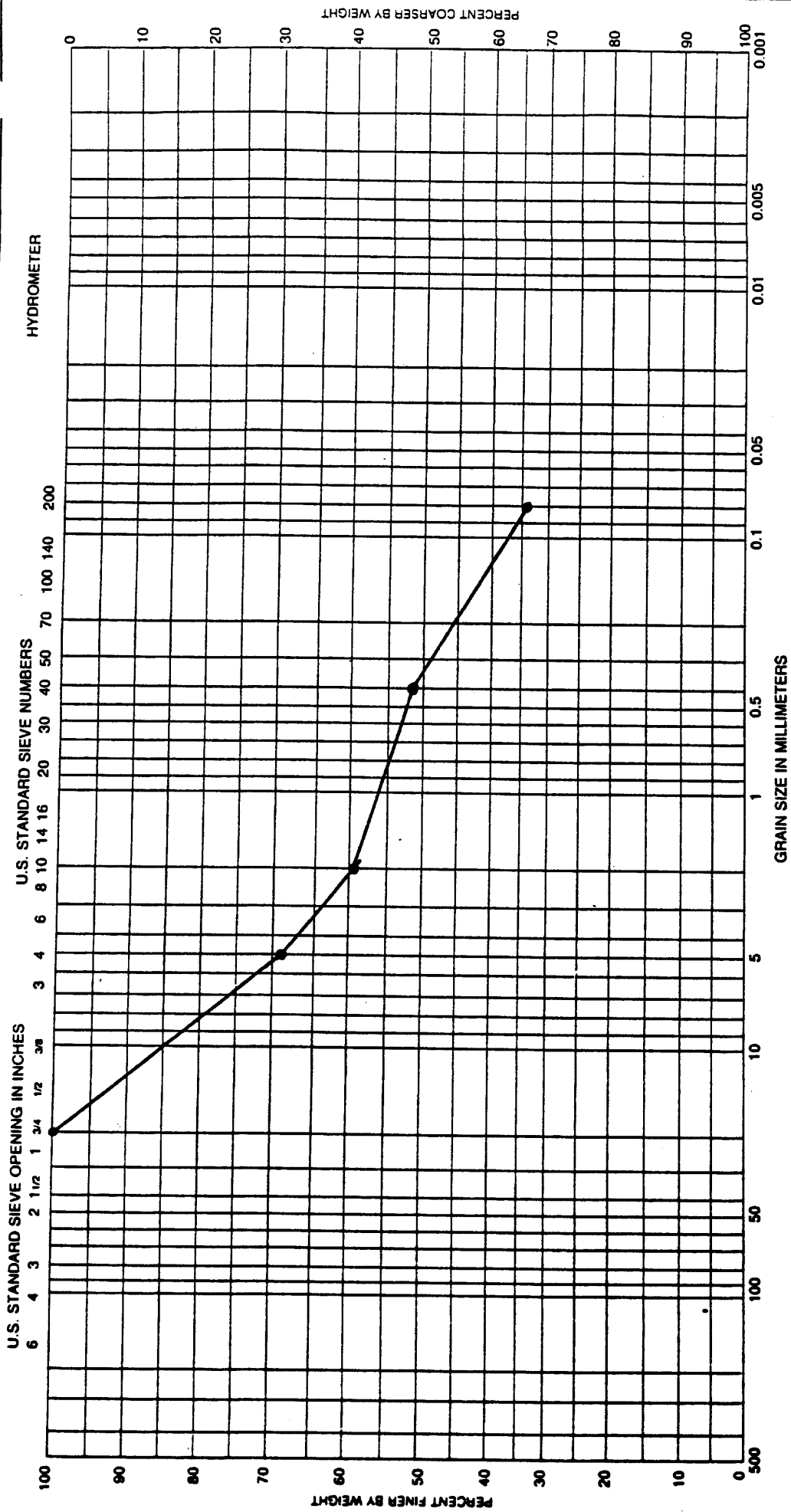




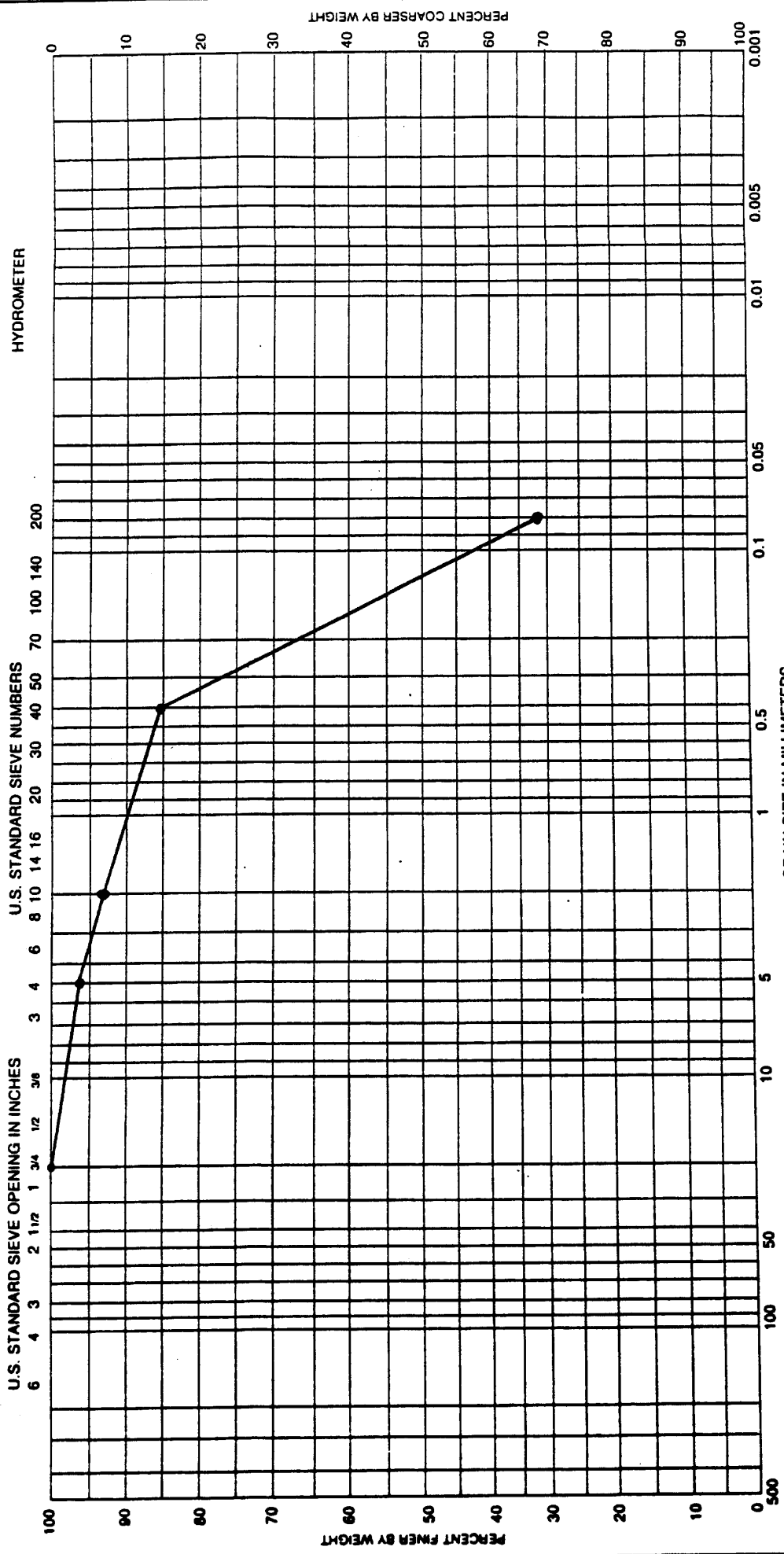
Sample No.	Elev or Depth	Classification	SAND			GRAVEL		SILT OR CLAY		Project	Area	Boring No.	Date
			Net w %	LL	PL	PI	COARSE	FINE	FINE				
MW-3 - 14	65'	Clayey Sand; Reddish Tan With Scattered Calcareous Nodules. Stiff, Dry (SC)	25	25	12	13				Amarillo	MSW-LF	MW-3	7-19-94
GRADATION CURVES													



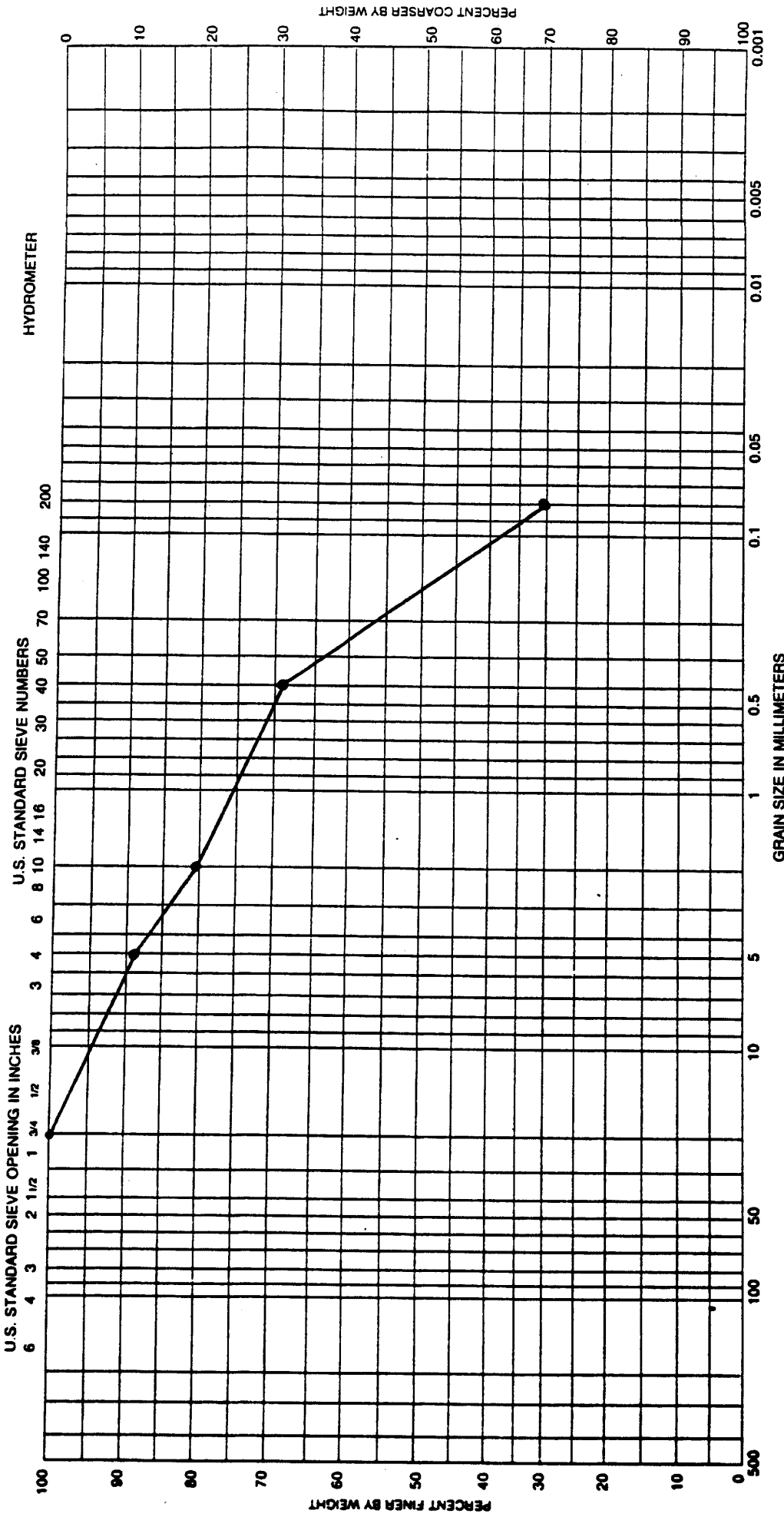
<b>COBBLES</b>		<b>GRAVEL</b>		<b>SAND</b>		<b>SILT OR CLAY</b>	
	COARSE	FINE	COARSE	NEUTRAL	FINE		
Sample No.	Classification						
MM-3 - 15	Clayey Sand; Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)						
Elev or Depth	70'						
	LL	PL	PI	Net w %	LL	PL	PI
	27	16	11		27	16	11
Project	Amarillo MSW-LF						
Area							
Boring No.	MM-3						
Date	7-19-94						
<b>GRADATION CURVES</b>							



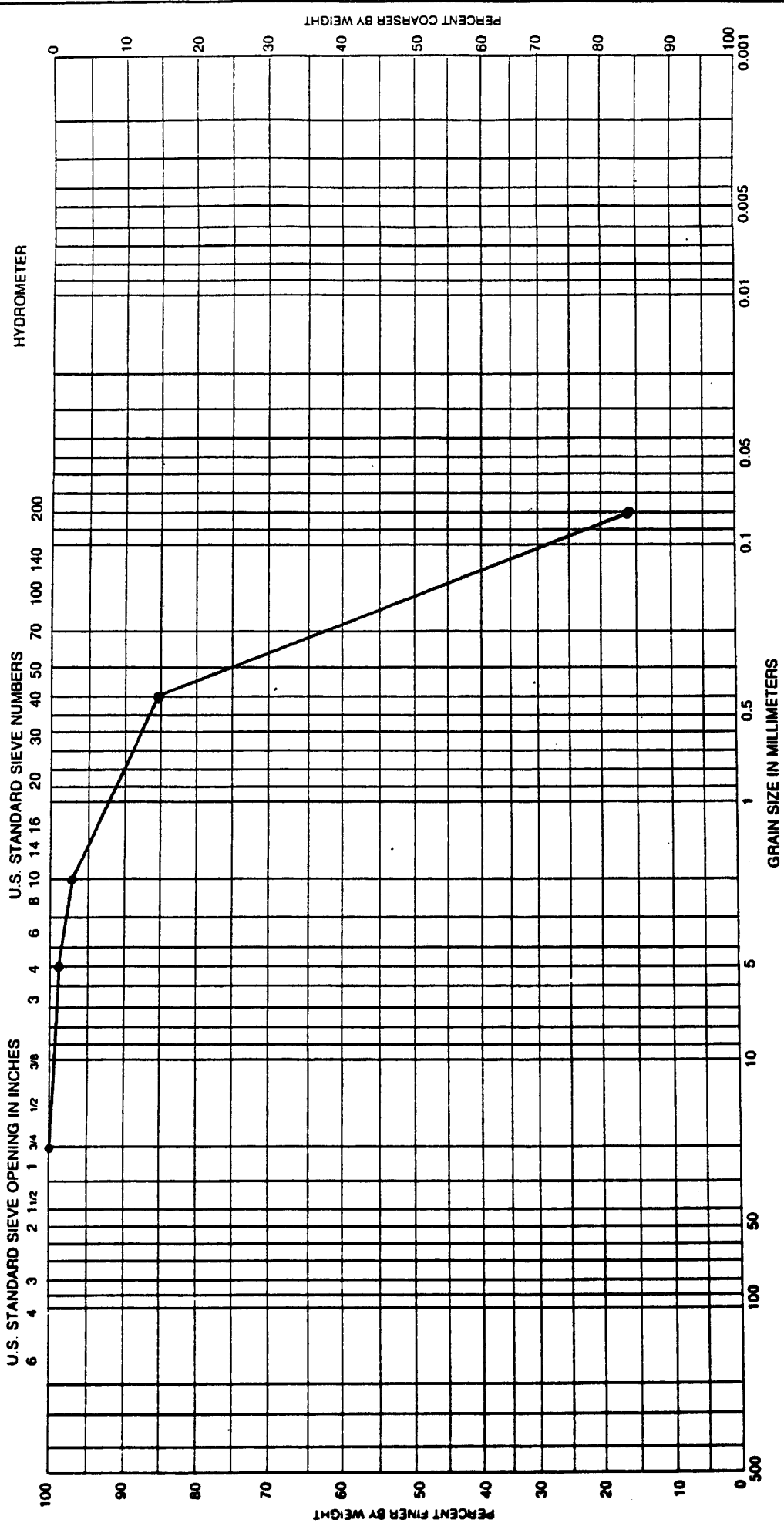
COBBLES	GRAVEL	SAND		SILT OR CLAY	
	COARSE	FINE	COARSE	NEUTRAL	FINE
Sample No.	Classification				
Elev or Depth	Clayey Sand; Reddish Tan With Scattered Calcareous Nodules. Stiff. Dry (SC)				
MW-3 - 16	75'	Net w %	26	LL	26
				PL	19
				PI	7
Project		Amarillo MSW-LF			
Area		MM-3			
Boring No.		MW-3			
Date		7-19-94			
GRADATION CURVES					



COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	FINE	
Sample No.	Elev or Depth	Classification					
MM-3 - 19	90'	Clayey Sand: Light Tan With Scattered Calcareous Nodules, Stiff, (SC)					
		Net w %	LL	PL	PI	Project	
			25	18	7	Amarillo MSW-LF	
		Area					
		Boring No. MW-3					
		Date					
		7-19-94					
<b>GRADATION CURVES</b>							

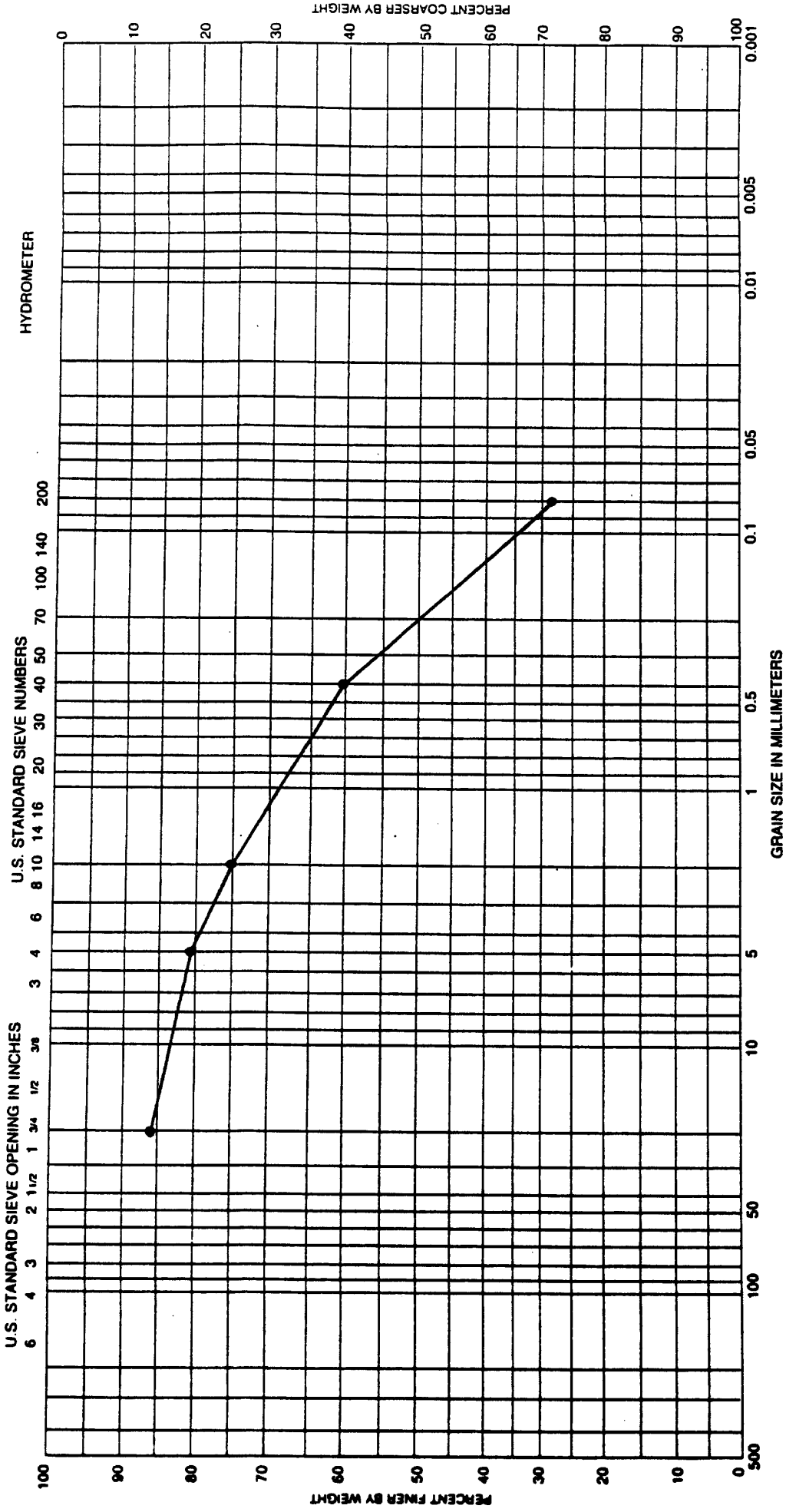


COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	NEUTRAL	FINE		
Sample No.	Elev or Depth	Classification				PI	Project
MW-3 - 20	95'	Clayey Sand: Light Tan With Scattered Calcareous Nodules, Stiff, (SC)				19	Amarillo MSW-LF
		Net w %	LL	PL	PI	Area	
			26	19	7	Boring No.	MW-3
						Date	7-19-94
<b>GRADATION CURVES</b>							



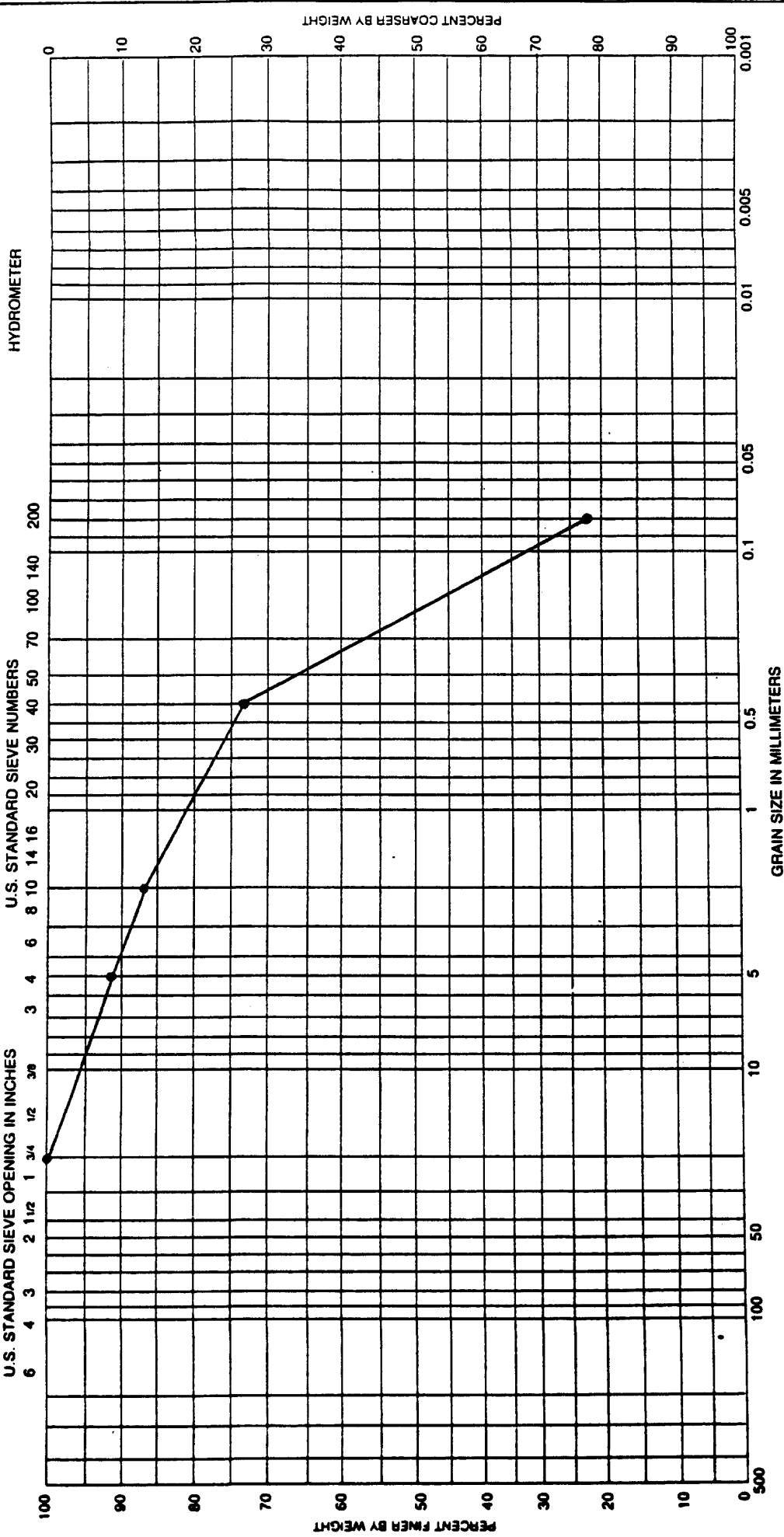
COBBLES		GRAVEL		SAND			SILT OR CLAY		
		COARSE	FINE	COARSE	NEUTRAL	FINE	COARSE	NEUTRAL	FINE
Sample No.	Elev or Depth	Classification			Net w %	LL	PL	PI	Project
MM-3 - 21	100'	Clayey Sand: Light Tan With Scattered Calcareous Nodules, Stiff, (SC)				21	16	5	Amarillo MSW-LF
									Area
									Boring No. MW-3
									Date 7-19-94

GRADATION CURVES



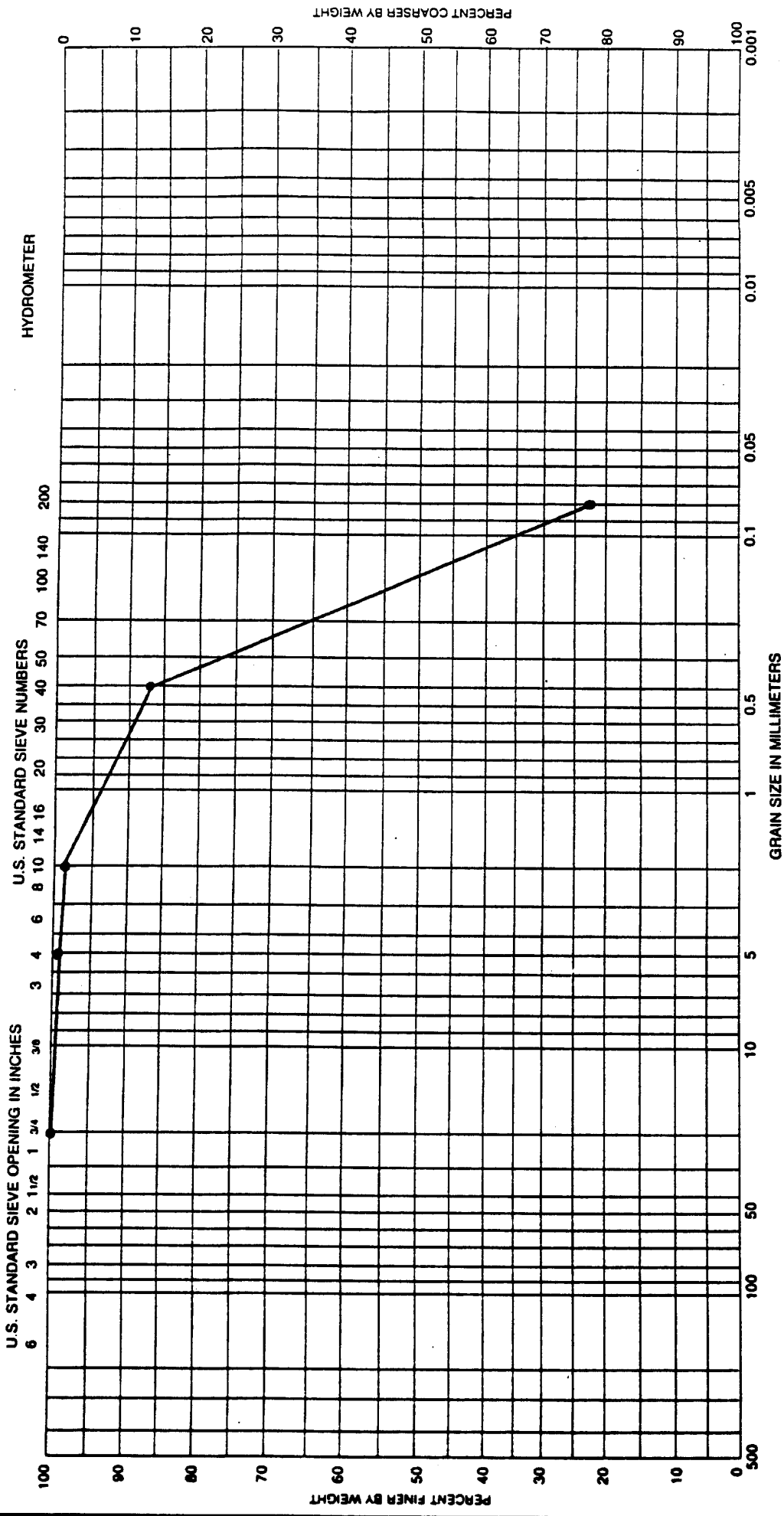
Sample No.	Elev or Depth	Classification				SAND				SILT OR CLAY		
		COARSE	FINE	COARSE	FINE	NETURAL	FINE	PI	PL			
MM-3 - 23	110'	Clayey Sand; Light Tan With Scattered Calcareous Nodules. Stiff. (SC)				Net w %	LL	PL	PI	Project	Amarillo	MSW-LF
						23	19	4	Area			
									Boring No.	MW-3		
									Date	7-19-94		

**GRADATION CURVES**



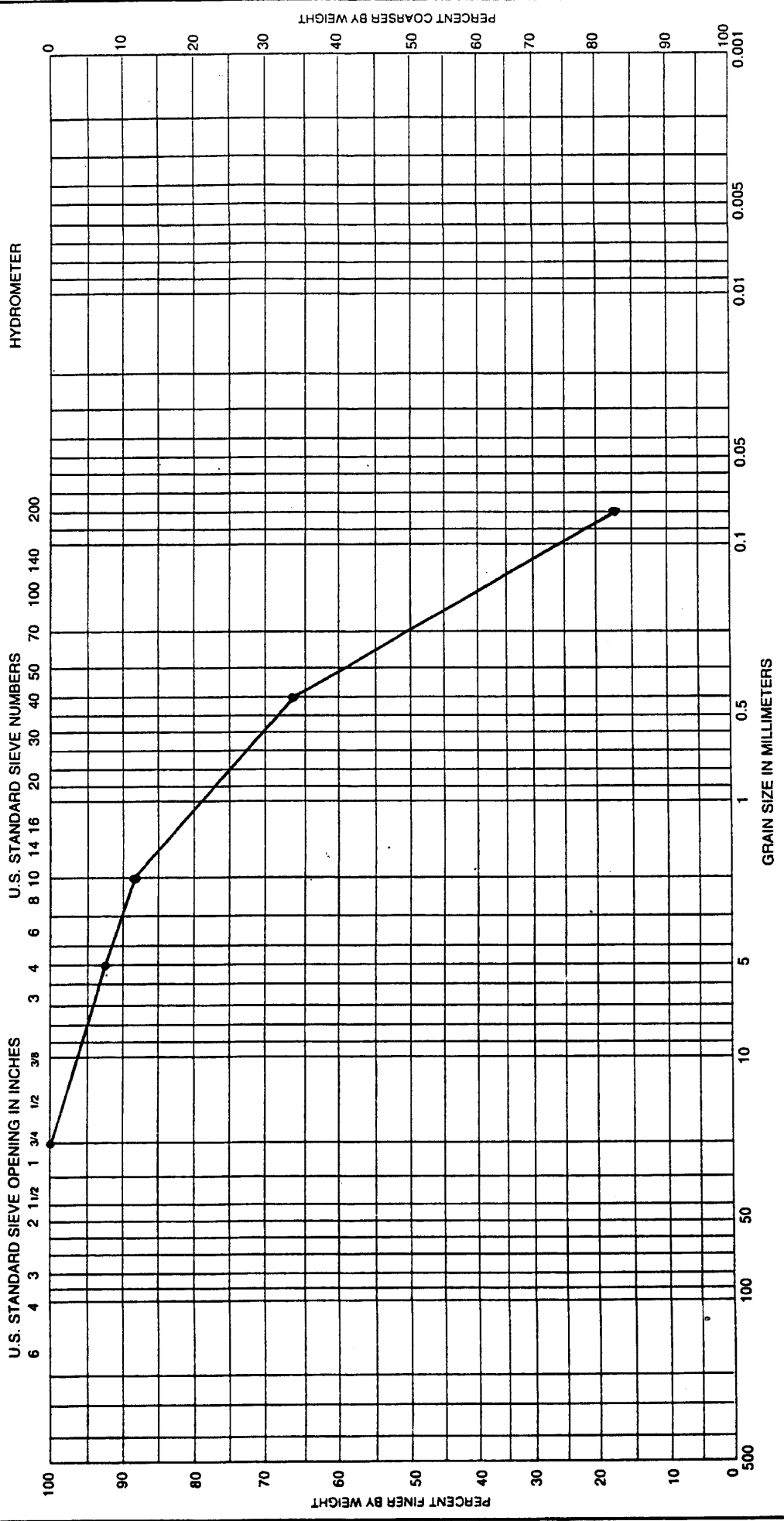
Sample No.	Elev or Depth	Classification	SAND			PI	Project	Area	Boring No.	Date
			Net w %	LL	PL					
MW-3 - 25	120'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, (SC)	19	16	3	Amarillo	MSW-LF	MW-3	7-19-94	
<b>GRADATION CURVES</b>										



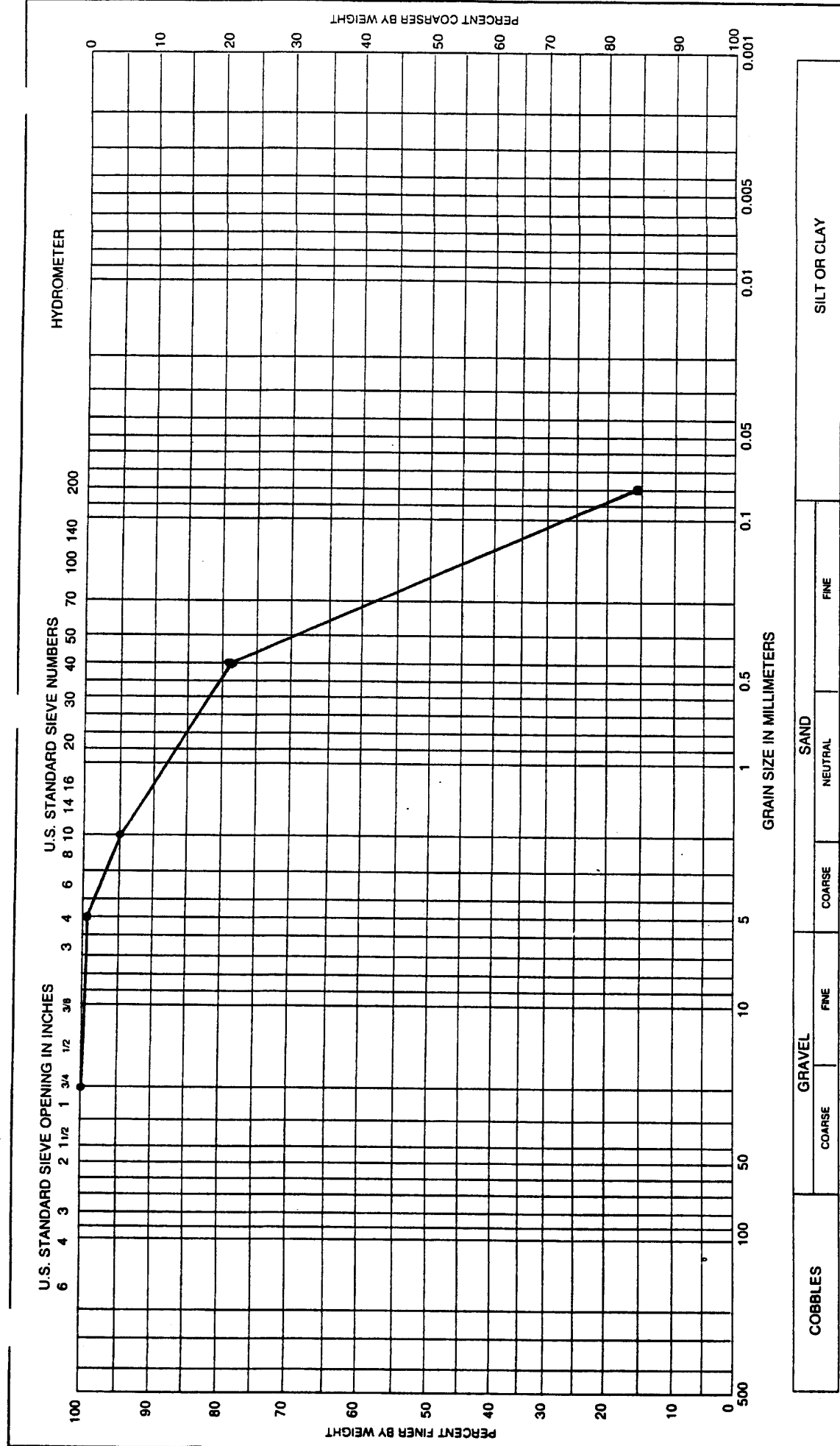


Sample No.	Elev or Depth	Classification	GRAVEL			SAND			PI	Project
			COARSE	FINE	COARSE	NEUTRAL	FINE			
MW-3 - 27	130'	Clayey Sand; Reddish Tan With Scattered Calcareous Nodules, Stiff, (SC)							Amarillo MSW-LF	
								22		
								19		
								3		
									Area	
									Boring No. MW-3	
									Date 7-19-94	

GRADATION CURVES

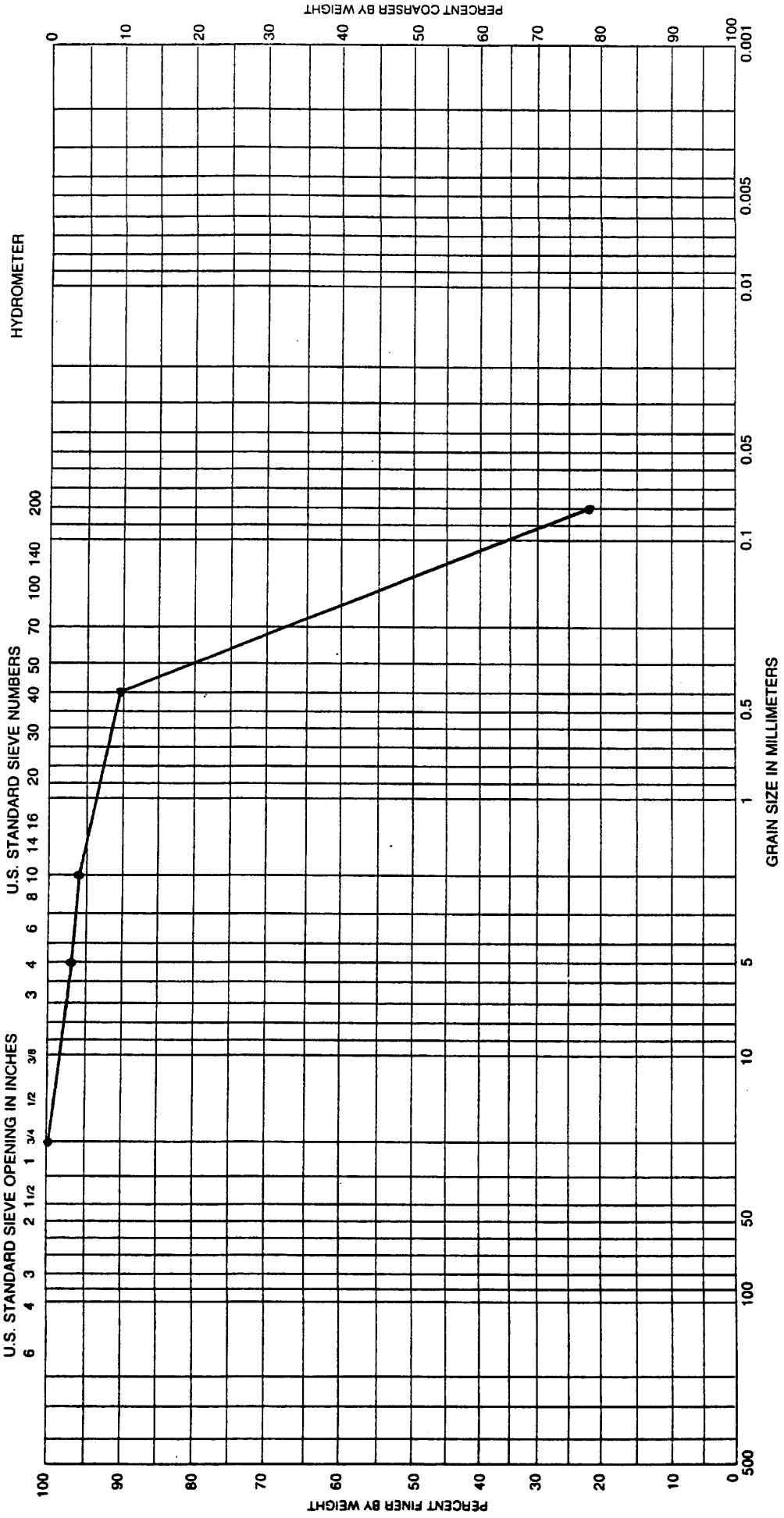


COBBLES		GRAVEL		SAND		SILT OR CLAY	
Sample No.	Elev or Depth	COARSE	FINE	NEUTRAL	FINE	PI	Date
MW-3 - 29	140'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff. (SC)		Net w %		19	7-19-94
		Classification		LL		16	
				PL		3	
				PI			
				Area			
				Boring No.		MW-3	
				Project		Amarillo MSW-LF	



Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-3 - 31	150'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules. Stiff. (SC)	19	16	3	
<b>GRADATION CURVES</b>						

	<b>COBBLES</b>	<b>GRAVEL</b>	<b>SILT OR CLAY</b>
COARSE	FINE	COARSE	FINE
		NEUTRAL	
Project	Amarillo MSW-LF		
Area			
Boring No.	MW-3		
Date	7-19-94		

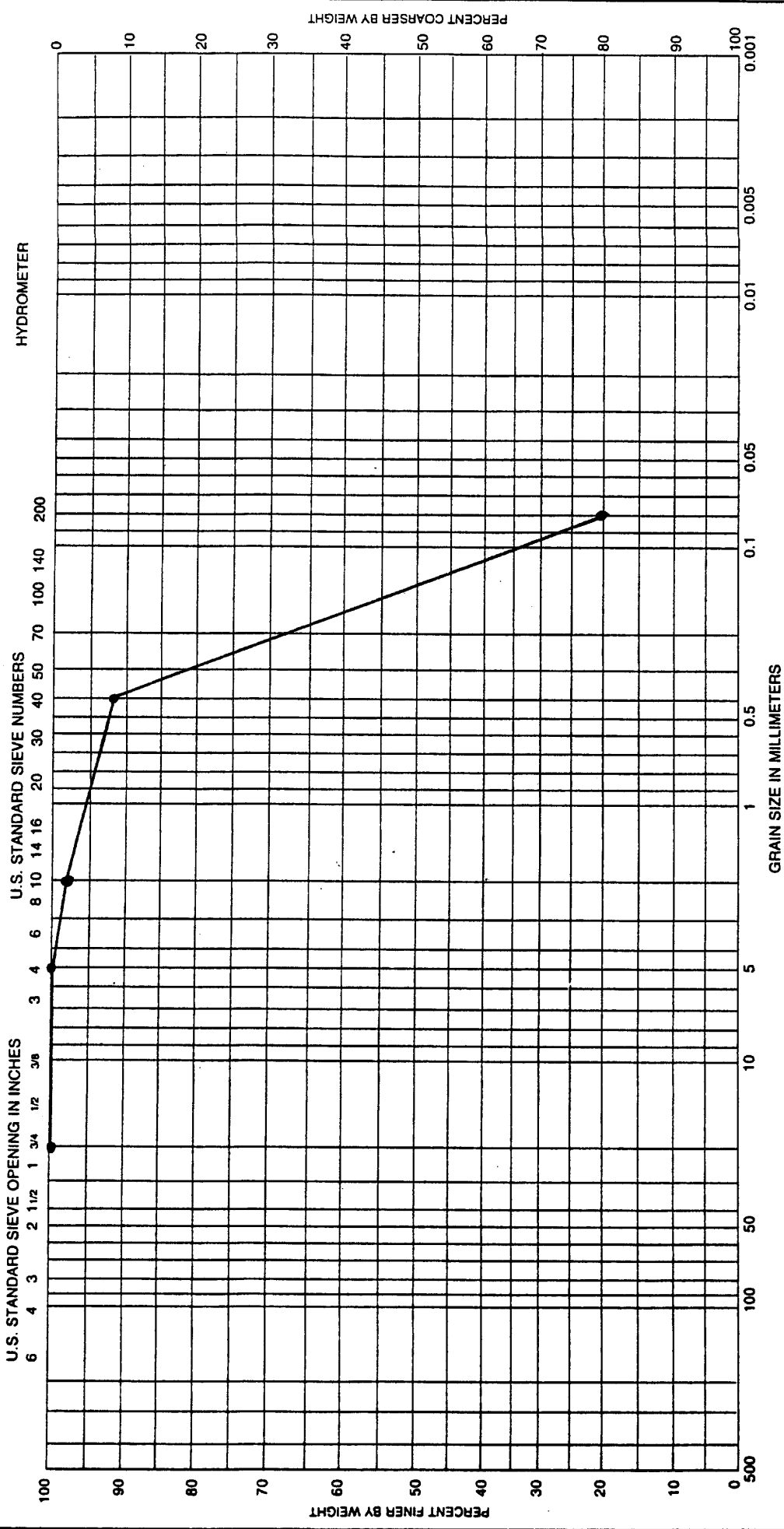


Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-3 - 33	160'	Clayey Sand; Reddish Tan With Scattered Calcareous Nodules, Stiff, (SC)		18	16	2

Project	Amarillo MSW-LF
Area	
Boring No.	MW-3
Date	7-19-94

GRADATION CURVES



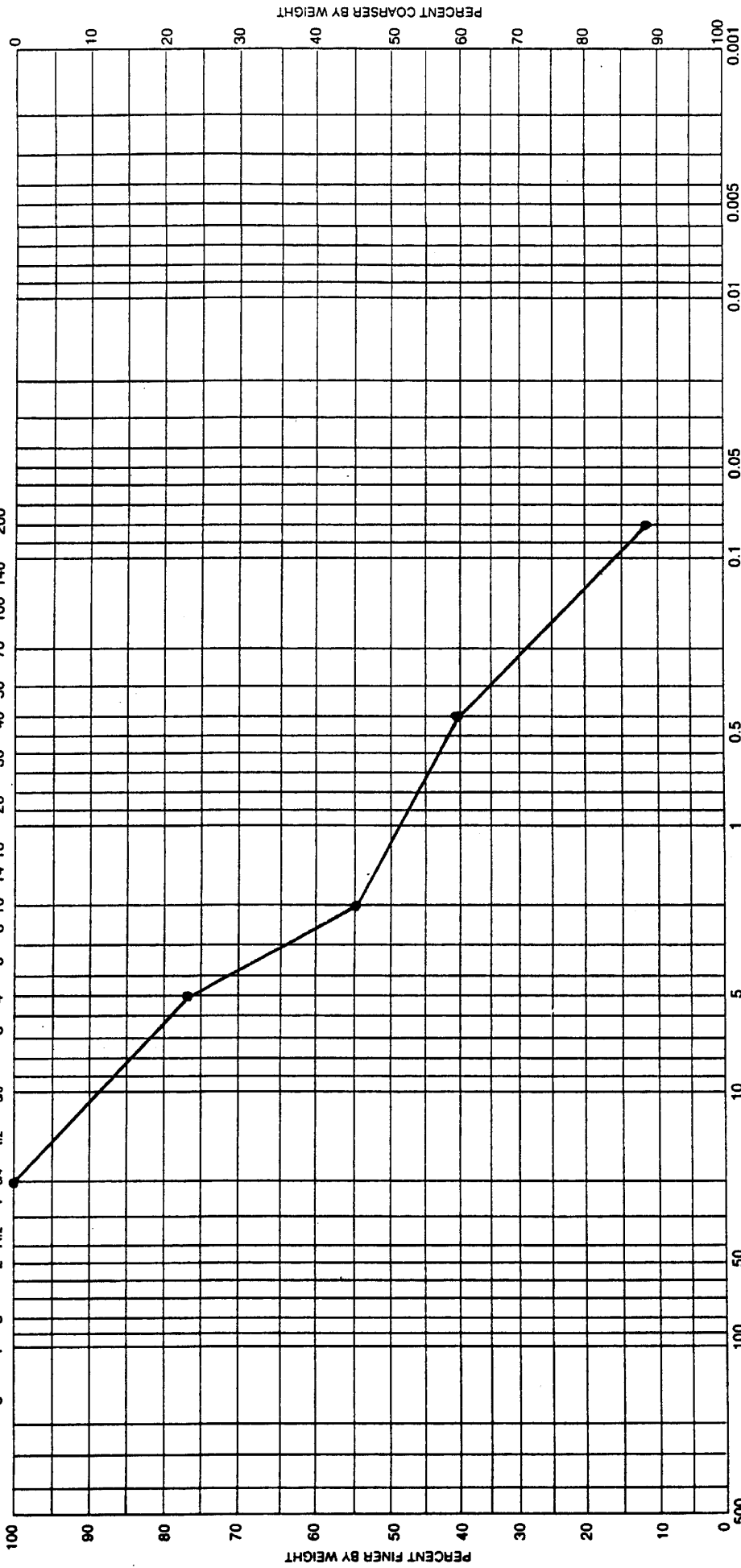
Sample No.	Elev or Depth	Classification	SAND			PI																		
			Net w %	LL	PL																			
MW-3 - 35	170'	Clayey Sand; Reddish Tan With Scattered Calcareous Nodules, Stiff, (SC)	19	17	2																			
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">COBBLES</th> <th colspan="2">GRAVEL</th> <th colspan="2">SILT OR CLAY</th> </tr> <tr> <th>COARSE</th> <th>FINE</th> <th>COARSE</th> <th>FINE</th> <th colspan="2"></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>							COBBLES		GRAVEL		SILT OR CLAY		COARSE	FINE	COARSE	FINE								
COBBLES		GRAVEL		SILT OR CLAY																				
COARSE	FINE	COARSE	FINE																					
Project			Amarillo MSW-LF																					
Area			MW-3																					
Boring No.			7-19-94																					
Date																								

**GRADATION CURVES**

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



GRAIN SIZE IN MILLIMETERS

COBBLES	GRAVEL		SAND		SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
MW-3 - 37	180'	Tan Sand: Well Sorted With Calcareous Nodules (SC)				NP

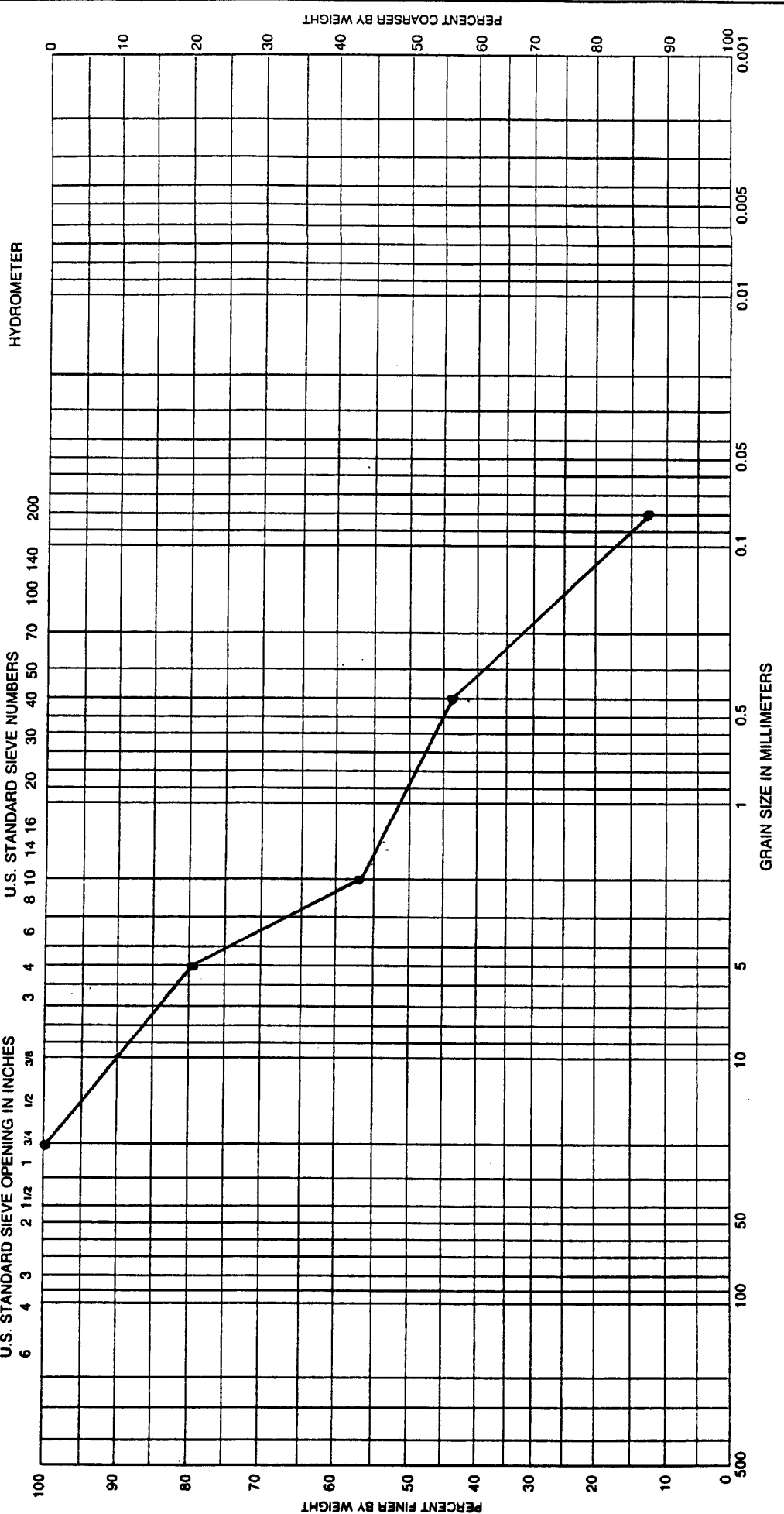
Project Amarillo MSW-LF

Area

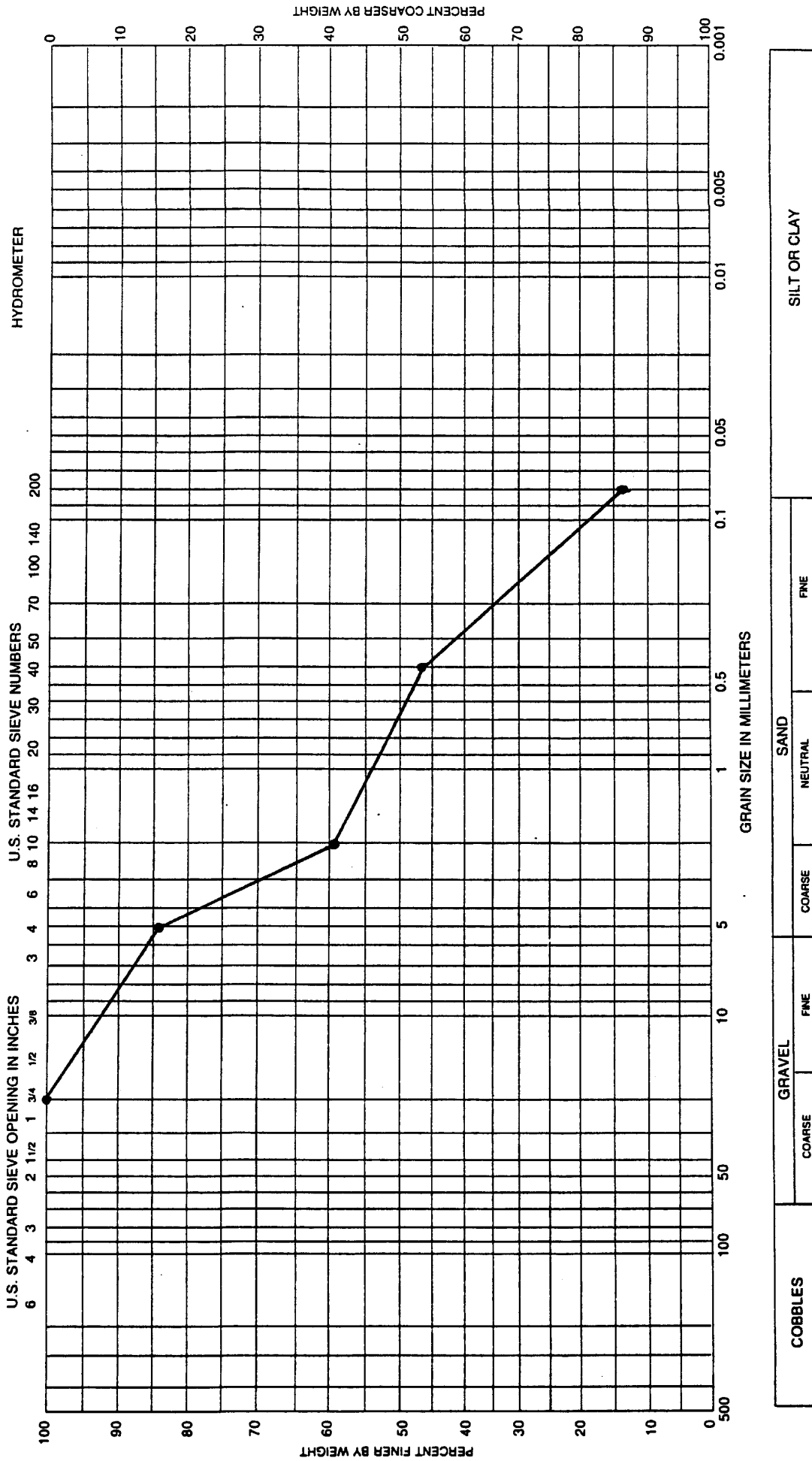
Boring No. MW-3

Date 7-19-94

GRADATION CURVES



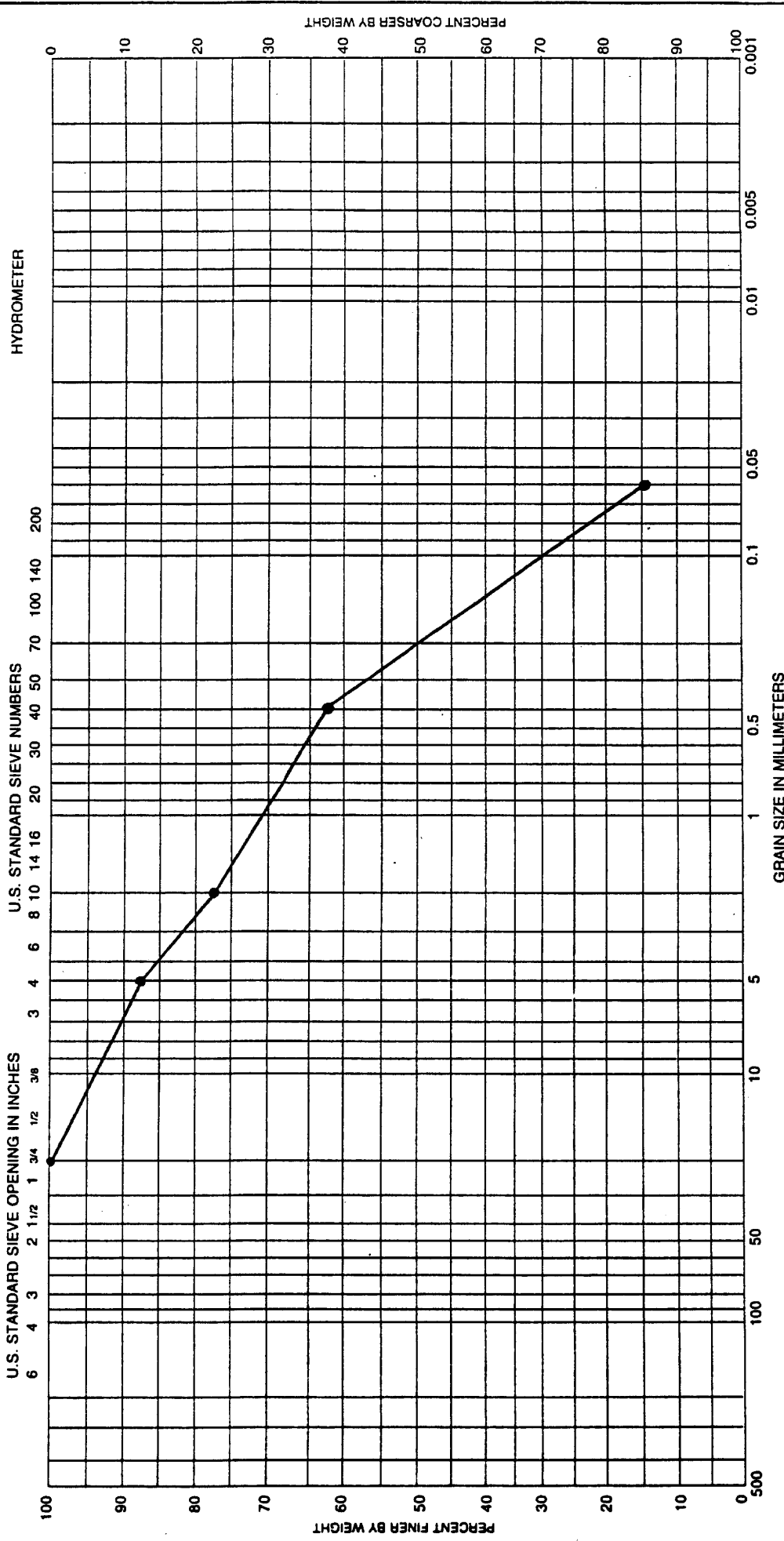
U.S. STANDARD SIEVE OPENING IN INCHES		U.S. STANDARD SIEVE NUMBERS		HYDROMETER														
6	4	3	2	1 1/2	1	3/4	1/2	3/8	200	140	100	70	50	40	30	20	10	0
U.S. STANDARD SIEVE OPENING IN INCHES		U.S. STANDARD SIEVE NUMBERS		HYDROMETER		GRAVEL		SAND		FINE		SILT OR CLAY						
COARSE		FINE		COARSE		NEUTRAL		FINE		SILT OR CLAY		SILT OR CLAY						
Sample No.	Elev or Depth	Classification		Net w %	LL	PL	PI	Project		Date								
MW-3 - 39	190'	Tan Sand: Pea Size Caliche Nodules (SC)					NP	Amarillo MSW-LF		7-19-94								
								Area										
								Boring No.		MW-3								
GRADATION CURVES																		



Sample No.	Elev or Depth	GRAVEL			SAND			SILT OR CLAY												
		COARSE	FINE	COARSE	NEUTRAL	FINE	COARSE	NEUTRAL	FINE											
MW-3 - 41	200'																			
Classification		Tan Sand: Pea Size									Caliche Nodules (SC)									
Project		Amarillo									MSW-LF									
Area											MW-3									
Boring No.											MW-3									
Date											7-19-94									

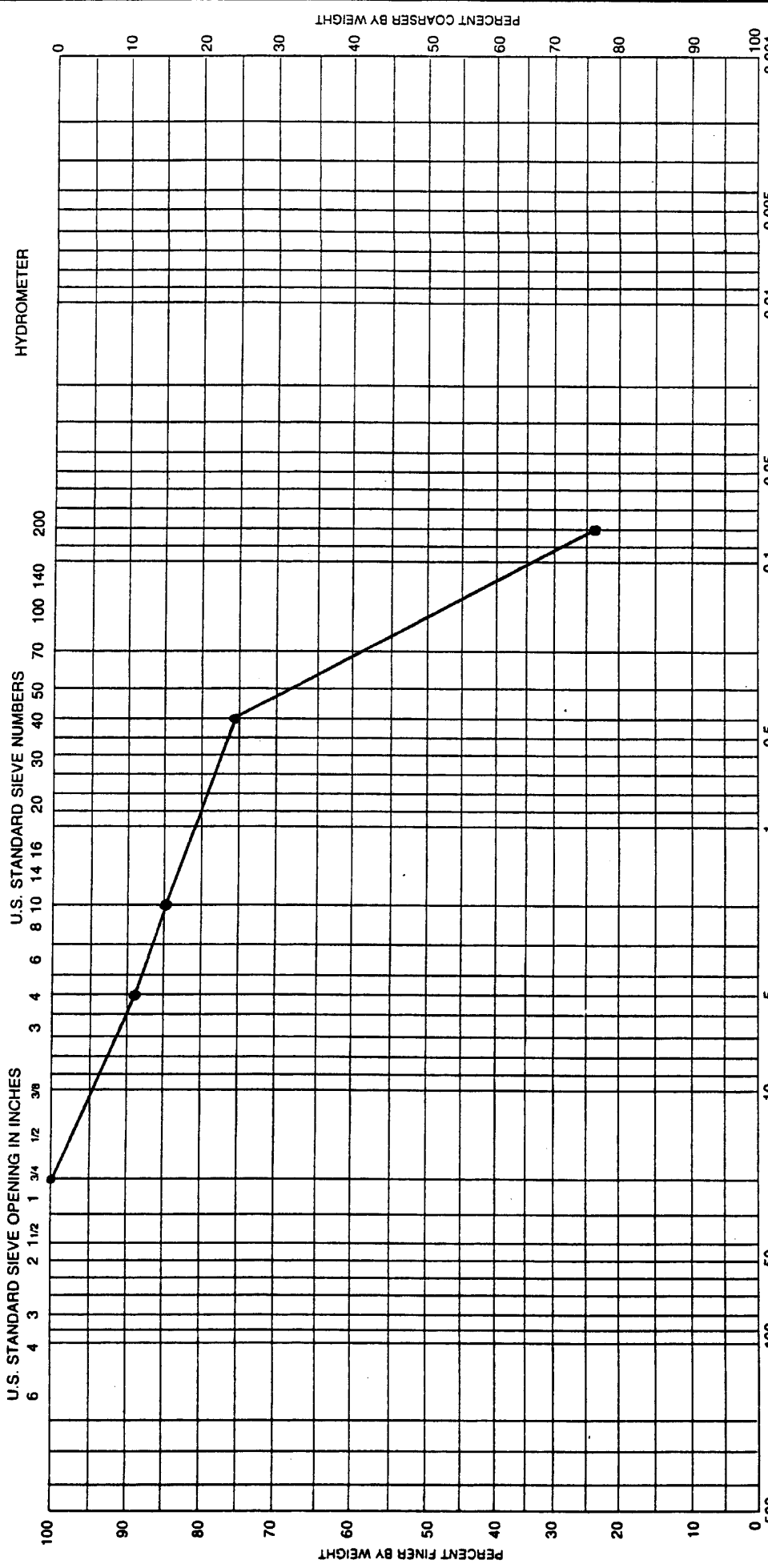
GRADATION CURVES





COBBLES		GRAVEL		SAND			SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	FINE		
Sample No.	Elev or Depth	Classification					PI	Project
MM-3 - 43	210'	Tan Sand: Pea Size Caliche Nodules (SC)					NP	Amarillo MSW-LF
								Area
								Boring No. MW-3
								Date 7-19-94

GRADATION CURVES



COBBLES		GRAVEL			SAND			SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	FINE	COARSE	FINER	CLAY
Sample No.	Elev or Depth	Classification							
MW-3 - 45	220'	Tan Sand: Pea Size							
		Caliche Nodules (SC)							

Project: Amarillo MSW-LF

Area:

Boring No.: MW-3

Date: 7-19-94

GRADATION CURVES



# LOG OF BORING

## MW - 4

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-4  
 LOCATION: Amarillo, Texas

Date: 8-11-94 thru 8-17-94

Ground Elevation: 3746.88'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE	
			GROUNDWATER INFORMATION: Air drilled to 150' Groundwater encountered at 155'										
			DESCRIPTION OF STRATUM										
0			Sandy Clay: Dark Brown, Dry (CL)										93.8
- 5 -		⊗	Sandy Clay: Reddish Tan w/Scattered Calcareous Nodules (8%) Stiff, Dry (CL) K = 2.83 X 10 <sup>-7</sup> cm/sec										89.7
- 10 -		⊗	20-6"										91.3
- 15 -		⊗	20-6"										88.3
- 20 -		⊗	42-6"										86.3
- 25 -		⊗	50-5.5"										85.5
- 30 -													

Continued on Page 2

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-4  
 LOCATION: Amarillo, Texas

Date: 8-11-94 thru 8-17-94

Ground Elevation: 3746.88'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SEIVE										
			GROUNDWATER INFORMATION: Air drilled to 150' Groundwater encountered at 155'																			
			DESCRIPTION OF STRATUM																			
30		X																				
35			Caliche: Light Tan, Limestone Cap, Very Hard (CL) (R)																			
40		X											50-1.5"	3.8								
45		X											31-6"	6.9		33	17	16			44.5	
													50-10"									
50		X	28-6"	6.1		28	17	11	2.25		39.1											
			50-9"																			
55		X	40-6"	6.9		30	17	13			37.3											
			50-7.5"																			
60																						

Continued on Page 3

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-4  
 LOCATION: Amarillo, Texas

Date: 8-11-94 thru 8-17-94

Ground Elevation: 3746.88'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE									
			GROUNDWATER INFORMATION: Air drilled to 150' Groundwater encountered at 155'																		
			DESCRIPTION OF STRATUM																		
60	○	X											11-16"	5.7		25	15	10		36.3	
														36-12"							
														50-15"							
65	○	X											16-6"	6.4		25	16	9		49.4	
														48-12"							
														50-12.5"							
70	○	X											50-1.5"								
75	○	X											30-6"	4.9		25	16	9		31.9	
														50-8.5"							
80	○	X											19-6"	5.6		23	19	4		27.7	
														50-10.5"							
85	○	X											36-6"	4.1		23	14	9		28.9	
														50-8.5"							
90	○	X																			

Continued on Page 4

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-4  
 LOCATION: Amarillo, Texas

Date: 8-11-94 thru 8-17-94

Ground Elevation: 3746.88'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air drilled to 150' Groundwater encountered at 155'									
			DESCRIPTION OF STRATUM									
90	○	X										
95	○	X										
100	○	X										
105	○	X										
110	○	X										
115	○	X										
120	○	X										

Clayey Sand: Reddish Tan  
 w/Scattered Calcareous  
 Nodules(10%) Stiff, Dry (SO)

Continued on Page 5



## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-4  
 LOCATION: Amarillo, Texas

Date: 8-11-94 thru 8-17-94

Ground Elevation: 3746.88'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air drilled to 150' Groundwater encountered at 155'									
			DESCRIPTION OF STRATUM									
120	○	X										
125												
130	○	X										
135												
140	○	X										
145												
150	○	X	Sand: Tan, Fine Grain w/Scattered Pea Gravel (SC)									
			Continued on Page 6									

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-4  
 LOCATION: Amarillo, Texas

Date: 8-11-94 thru 8-17-94

Ground Elevation: 3746.88'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air drilled to 150' Groundwater encountered at 155'									
DESCRIPTION OF STRATUM												
150	○	K = $8.34 \times 10^{-5}$ cm/sec  Sand: Tan w/Pea Size Calcareous Nodules(15%) Well Sorted (SC)(R)	23-6"	MD								14.1
155	○											
160	○		50-3"	MD					NP			LF
165	○											
170	○	Sand: Tan w/Scattered Calcareous Nodules(10%) Well Sorted (SC)	45-6"	MD								21.3
	○		50-6.5"									
175	○											
180	○											

Continued on Page 7

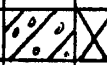
## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-4  
 LOCATION: Amarillo, Texas

Date: 8-11-94 thru 8-17-94

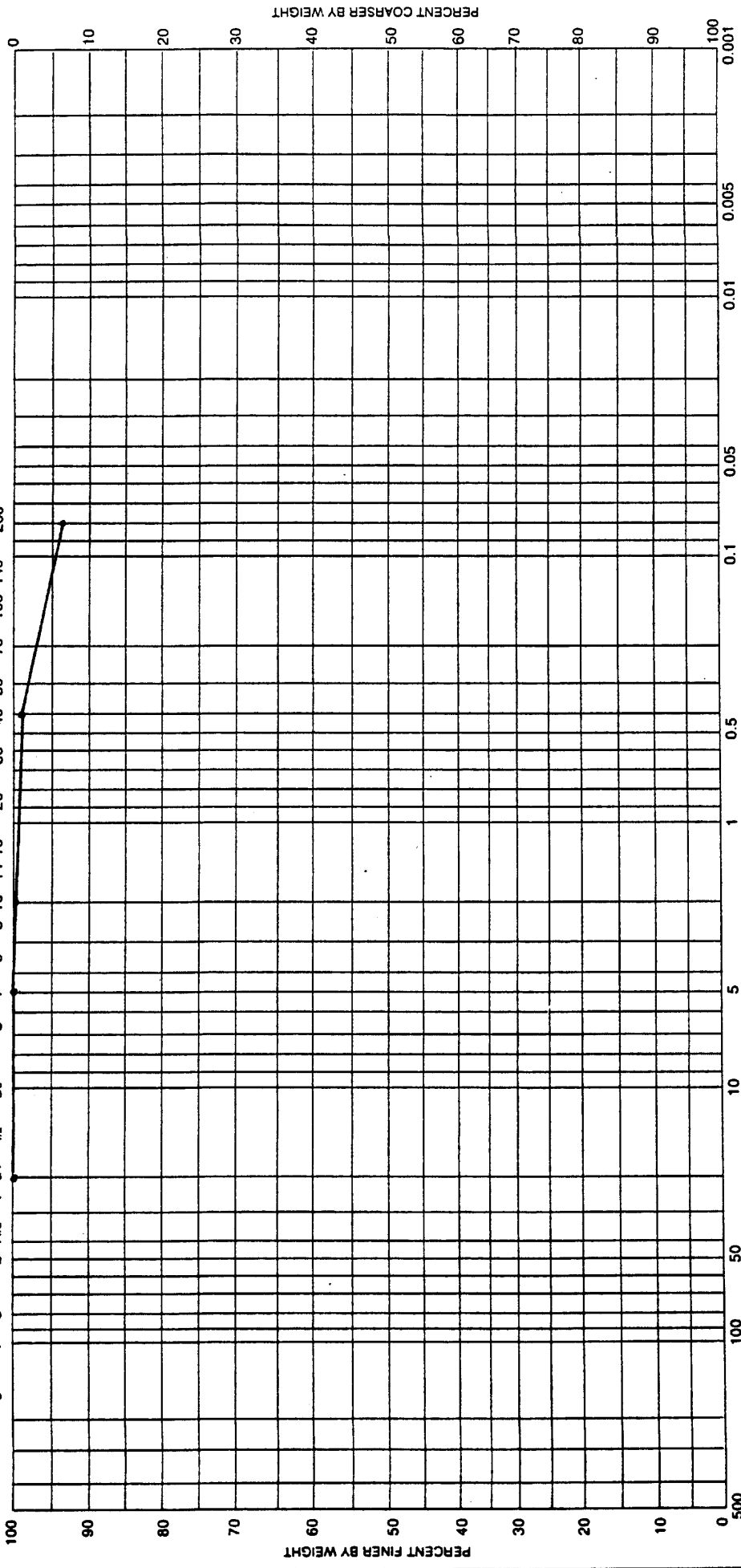
Ground Elevation: 3746.88'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary GROUNDWATER INFORMATION: Air drilled to 150' Groundwater encountered at 155' DESCRIPTION OF STRATUM	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
180		X	Sand: Reddish Tan w/Scattered Calcareous Nodules (SC.)	50-5"	MD		22	20	NP		13.1
			* T.D. - 180' *								

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



PERCENT COARSER BY WEIGHT

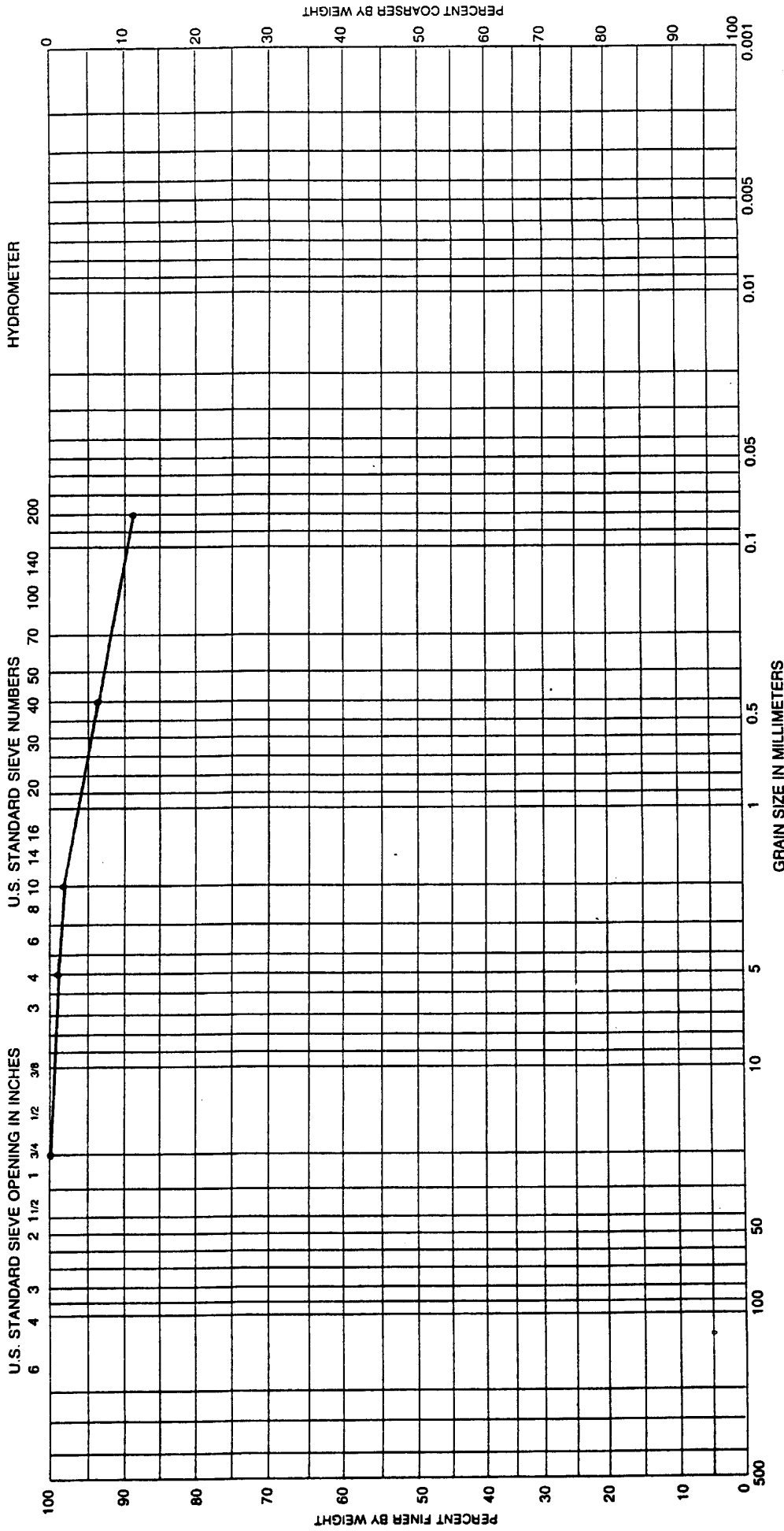
PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

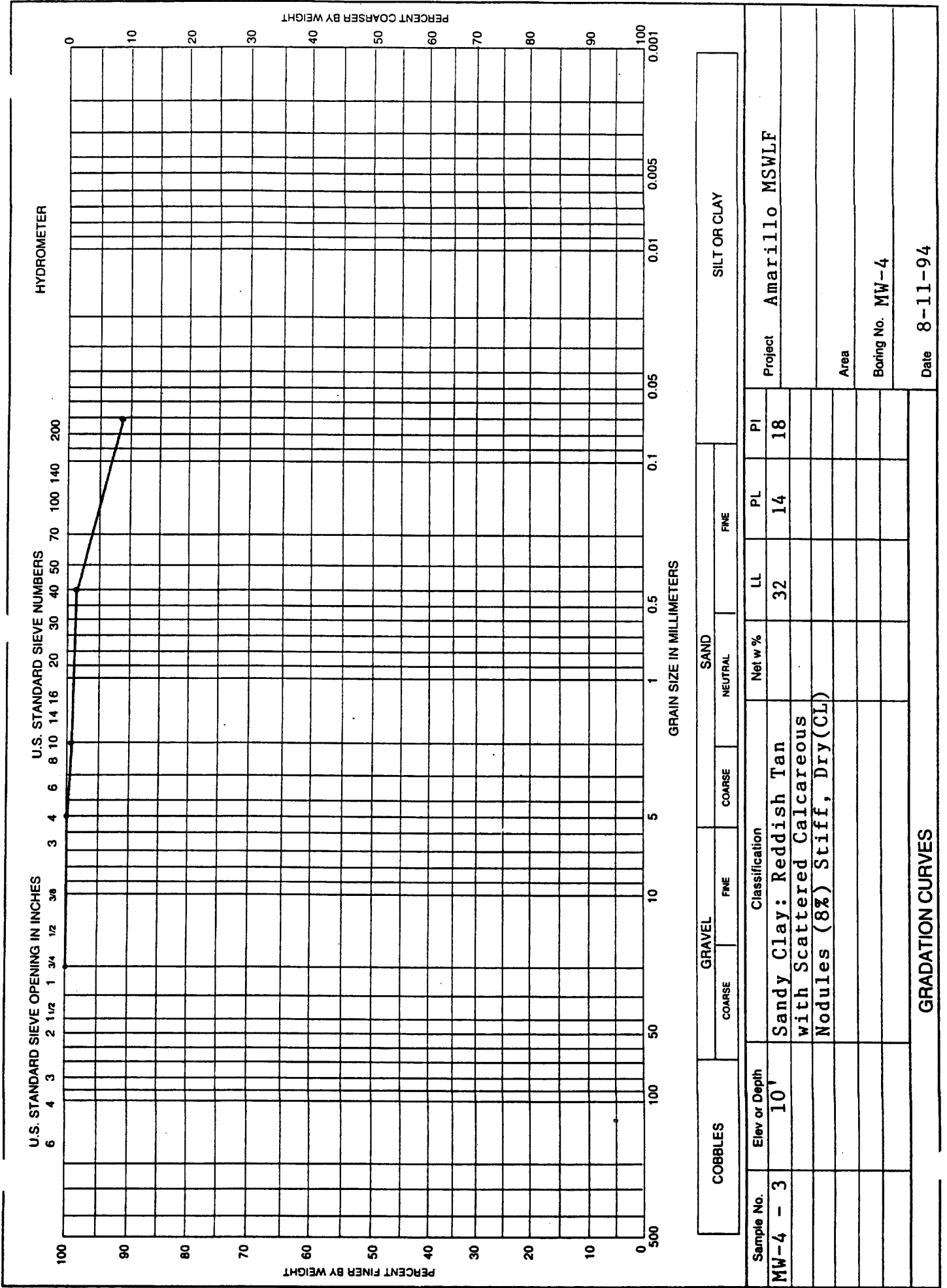
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
MW-4 - 1	0-2'	Sandy Clay: Dark Brown, Dry (CL)		34	15	19	Amarillo MSWLF
							Area
							Boring No. MW-4
							Date 8-11-94

GRADATION CURVES



Sample No.	Elev or Depth	GRAVEL			SAND			SILT OR CLAY			Project
		COARSE	FINE	NEUTRAL	NET W %	LL	PL	PI	Area	Boring No.	
MW-4 - 2	5'				32	15	17				Amarillo MSWLF
		Classification: Sandy Clay: Reddish Tan with Scattered Calcareous Nodules (8%) Stiff, Dry (CL)									
		GRADATION CURVES									

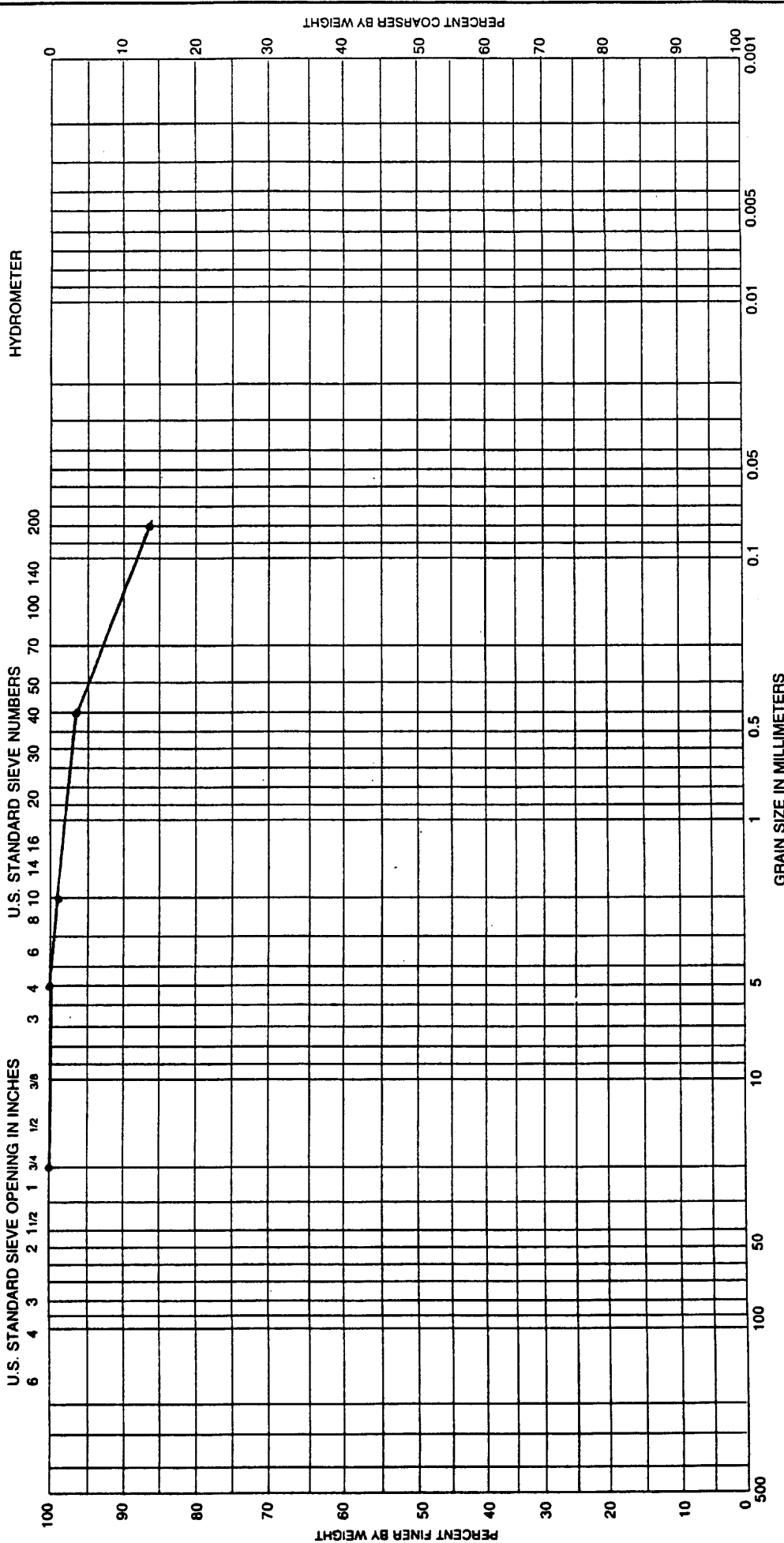


COBBLES		GRAVEL		SAND			SILT OR CLAY		
		COARSE	FINE	COARSE	NEUTRAL	FINE			
Sample No.	Elev or Depth	Classification						PI	
MW-4 - 3	10'	Sandy Clay: Reddish Tan with Scattered Calcareous Nodules (8%) Stiff, Dry (CL)						PL	18
		Net w %						LL	32
								PL	14
								Area	
								Boring No.	MW-4
								Date	8-11-94

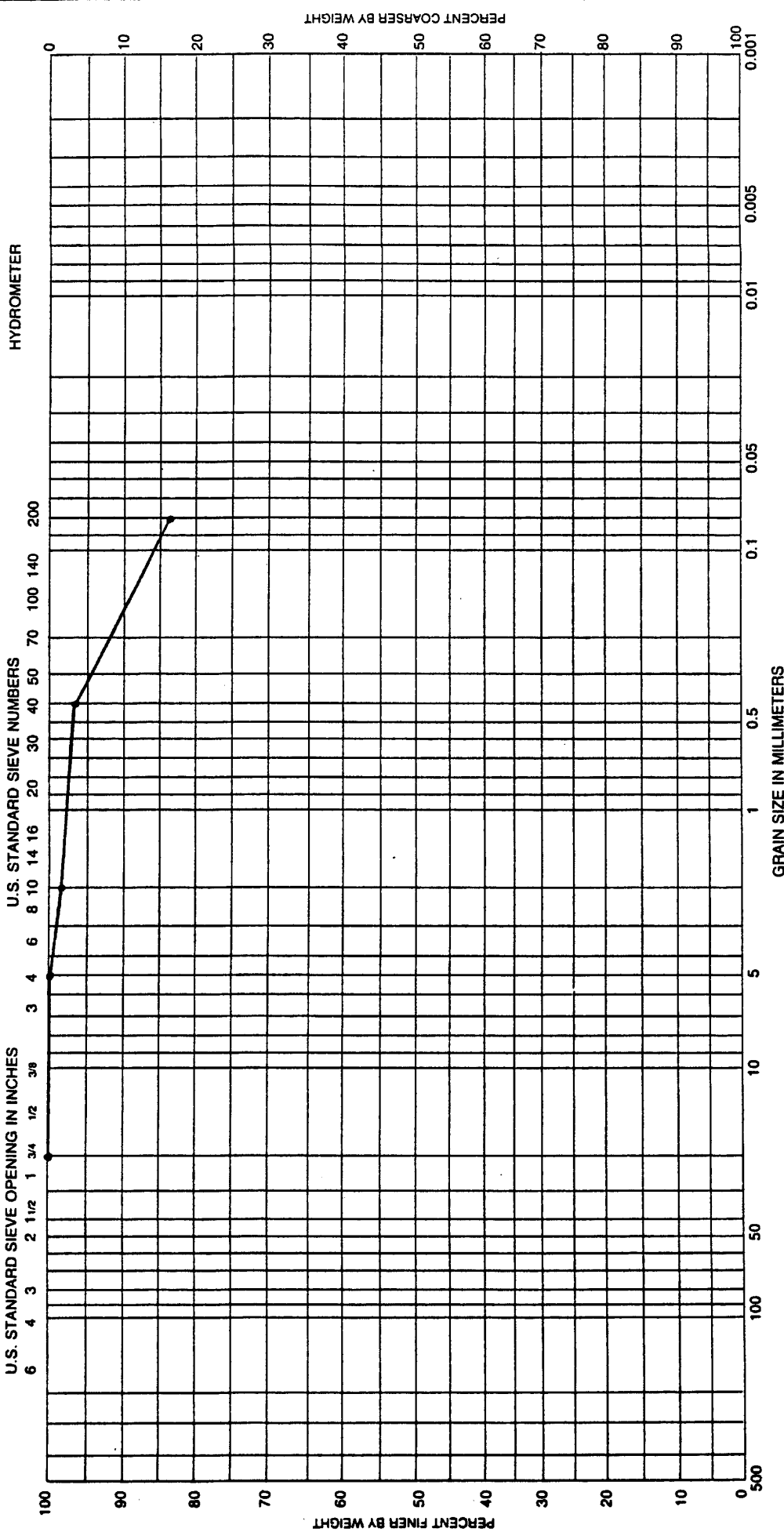




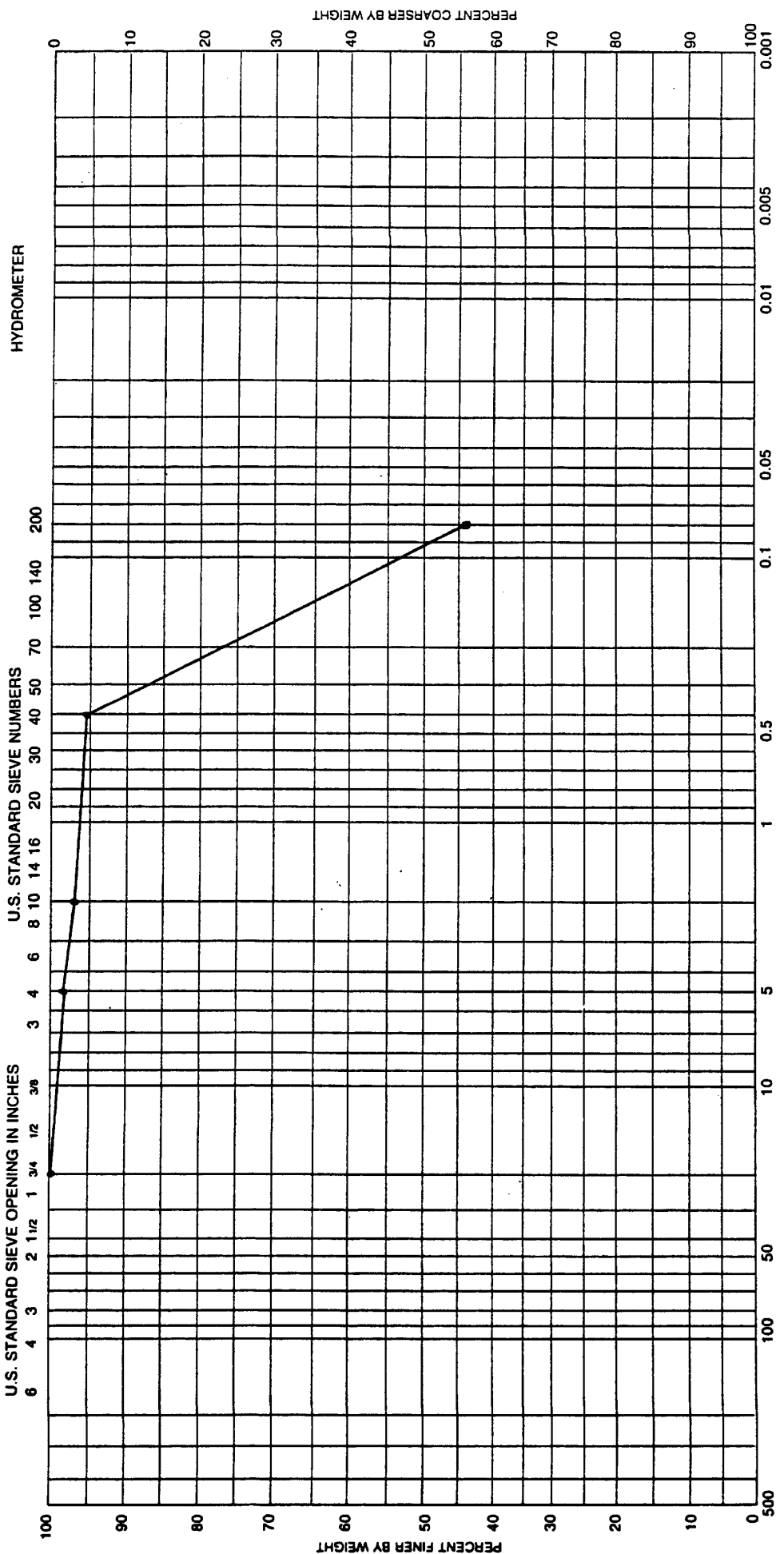




	COBBLES	GRAVEL	SAND	SILT OR CLAY	
	COARSE	FINE	NEUTRAL	FINE	
Sample No.	Classification				
MW-4 - 6	Sandy Clay: Reddish Tan with Scattered Calcareous Nodules(8%) Stiff, Dry (CL)				Project Amarillo MSWLF
Elev or Depth					Area
25'	Net w %				Boring No. MW-4
	LL				Date 8-11-94
	PL				
	PI				
GRADATION CURVES					



COBBLES		GRAVEL		SAND		FINE		SILT OR CLAY	
		COARSE		FINE		NEUTRAL		FINE	
Sample No.	Elev or Depth	Classification							
MW-4 - 7	30'	Sandy Clay: Reddish Tan with Scattered Calcareous Nodules (8%) Stiff, Dry (CL)							
		Net w %	LL	PL	PI				
		30	19	11					
		Area							
		Boring No. MW-4							
		Date 8-11-94							
GRADATION CURVES									
		Project Amarillo MSWLF							

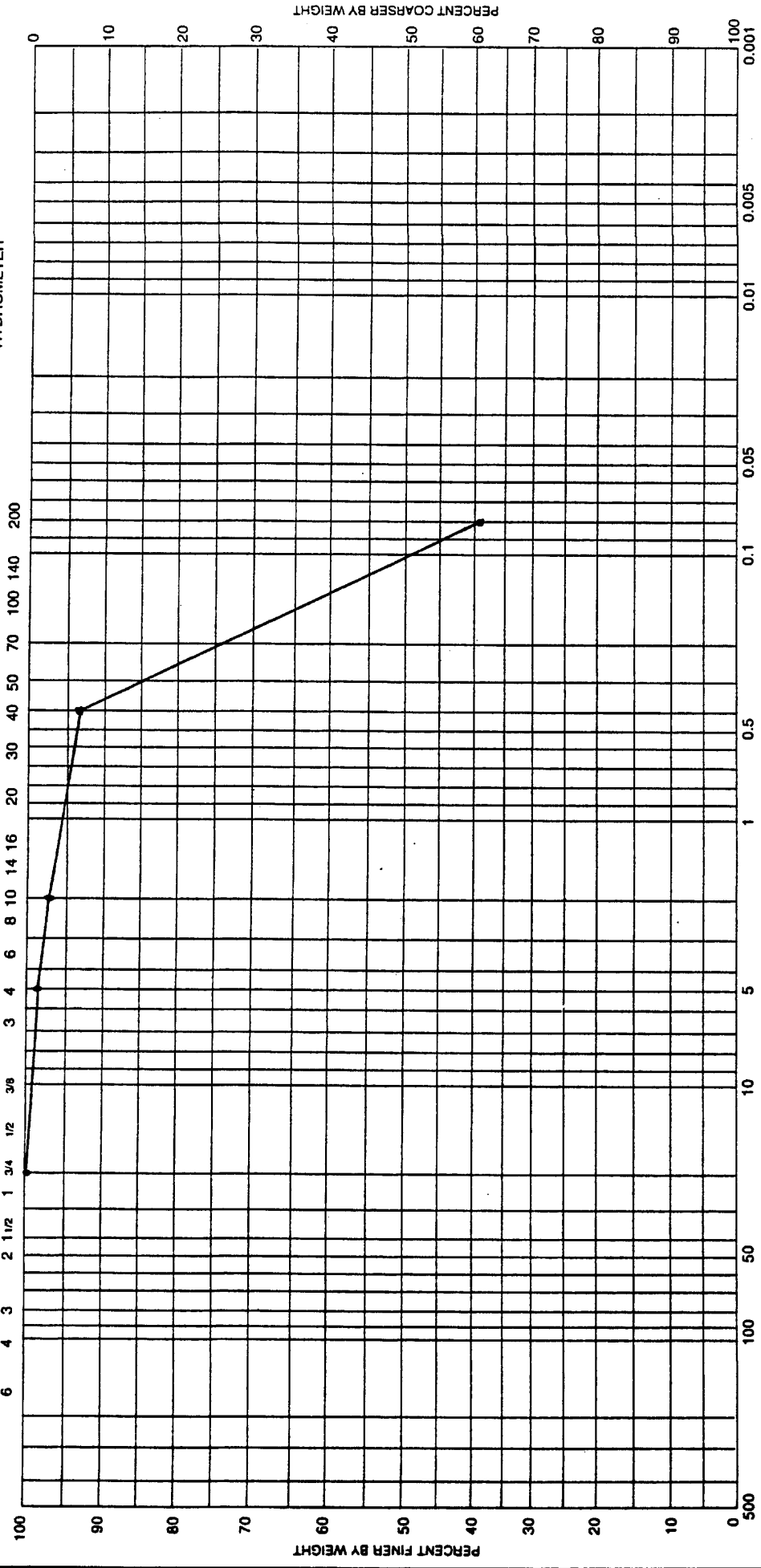


Sample No.	Elev or Depth	Classification	SAND			SILT OR CLAY			
			Net w %	LL	PL	PI	Area	Boring No.	Date
MW-4-10	45'	Clayey Sand: Reddish Tan w/Scattered Calcareous Nodules (10%) Stiff, Dry (SC)		33	17	16		MW-4	8-11-94
<b>GRADATION CURVES</b>									

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



Sample No.	Elev or Depth	GRAVEL			SAND			SILT OR CLAY	Project
		COARSE	FINE	COARSE	NEUTRAL	FINE	MSWLF		
MW-4-11	50'							Amarillo	
		Classification							
		Clayey Sand: Reddish Tan						PI	
		w/Scattered Calcareous						PL	
		Nodules (10%) Stiff, Dry (SC)						LL	
								Net w %	
								28	
								17	
								11	
		Area							
		Boring No.							MW-4
		Date							8-11-94

GRADATION CURVES

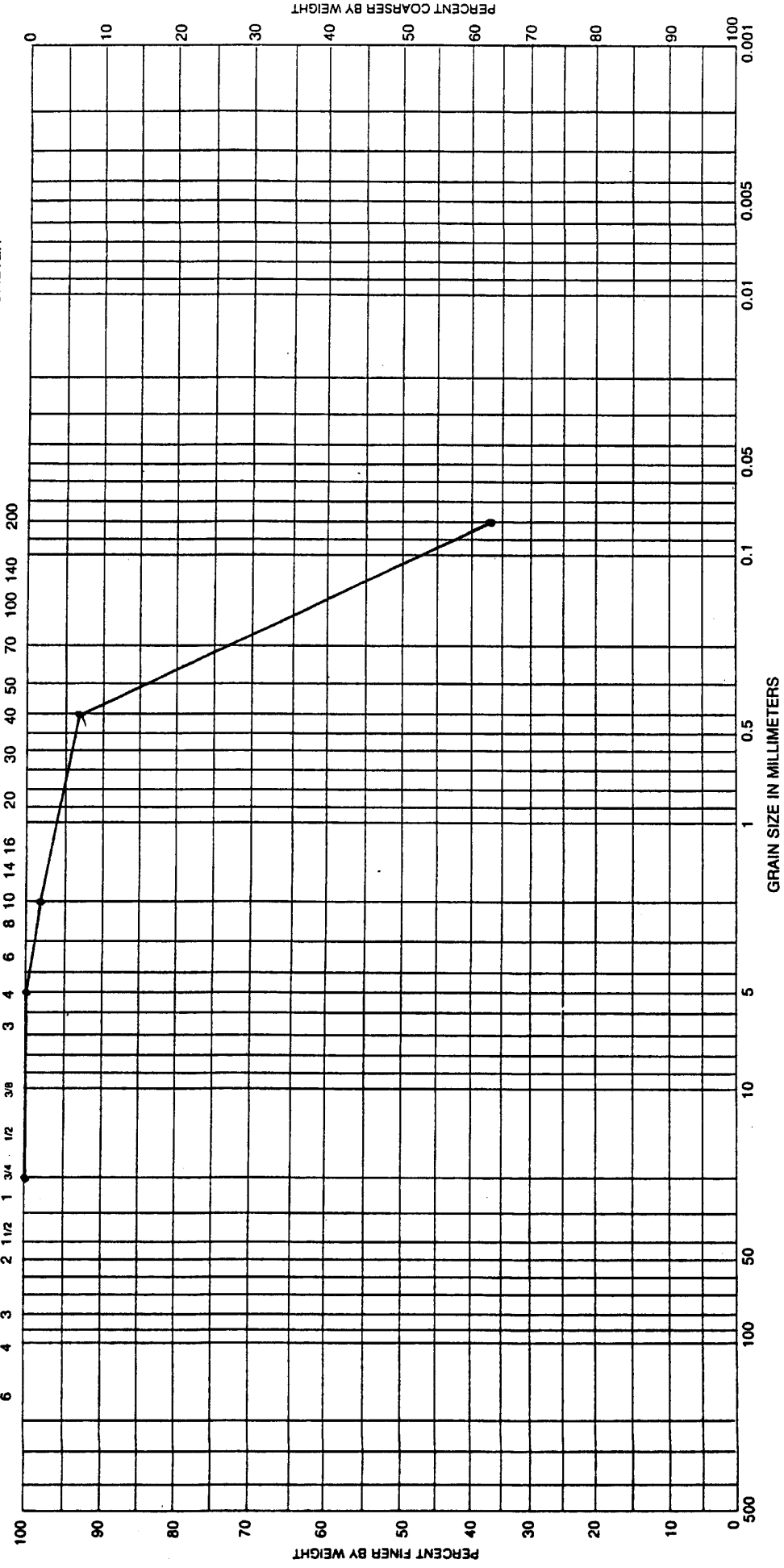
U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT



GRAIN SIZE IN MILLIMETERS

COBBLES	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	NEUTRAL	FINE			

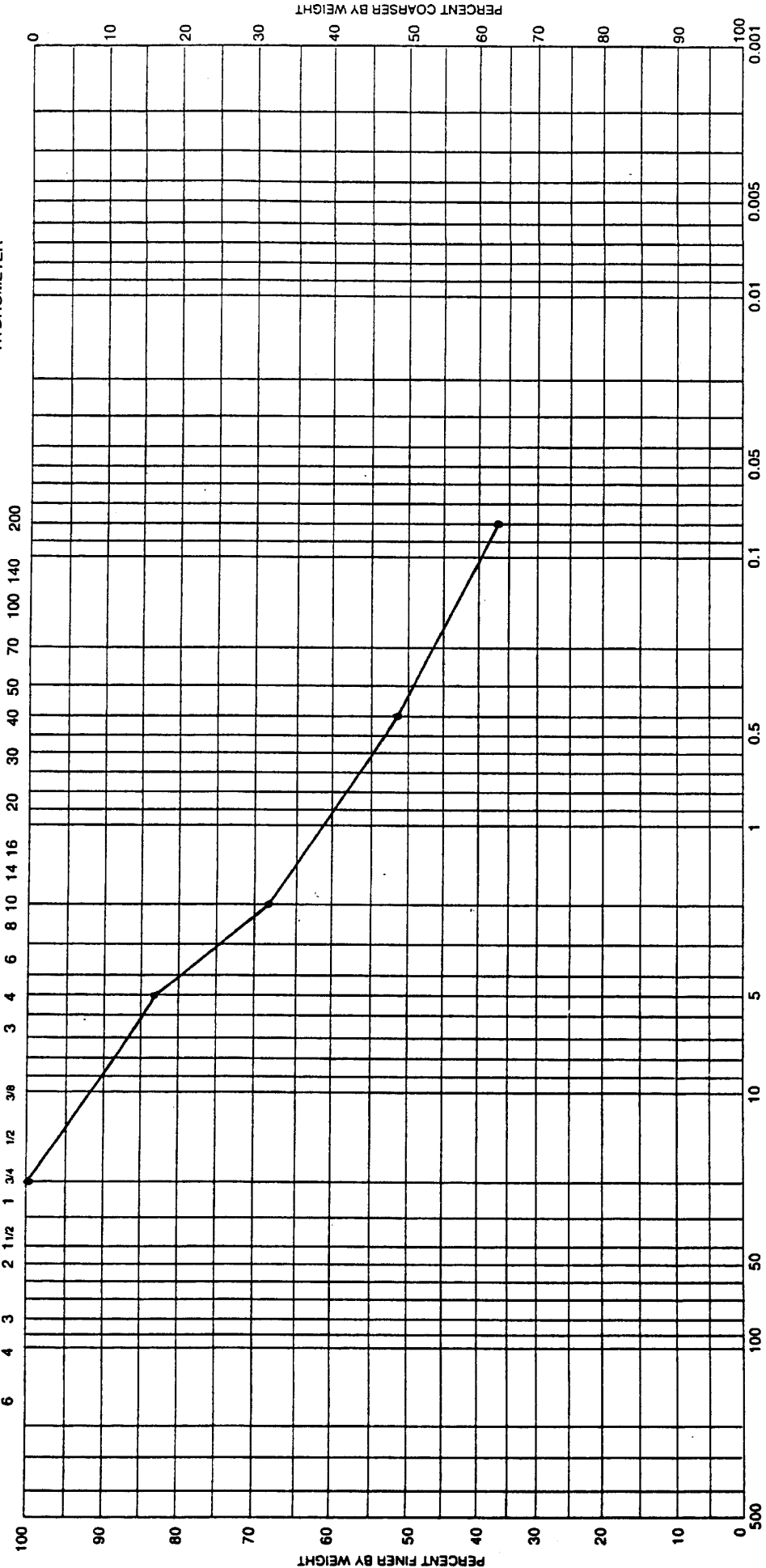
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
MW-4-12	55'	Clayey Sand: Reddish Tan w/Scattered Calcareous Nodules (10%) Stiff, Dry (SC)		30	17	13	Amarillo MSWLF
							Area
							Boring No. MW-4
							Date 8-11-94

GRADATION CURVES

HYDROMETER

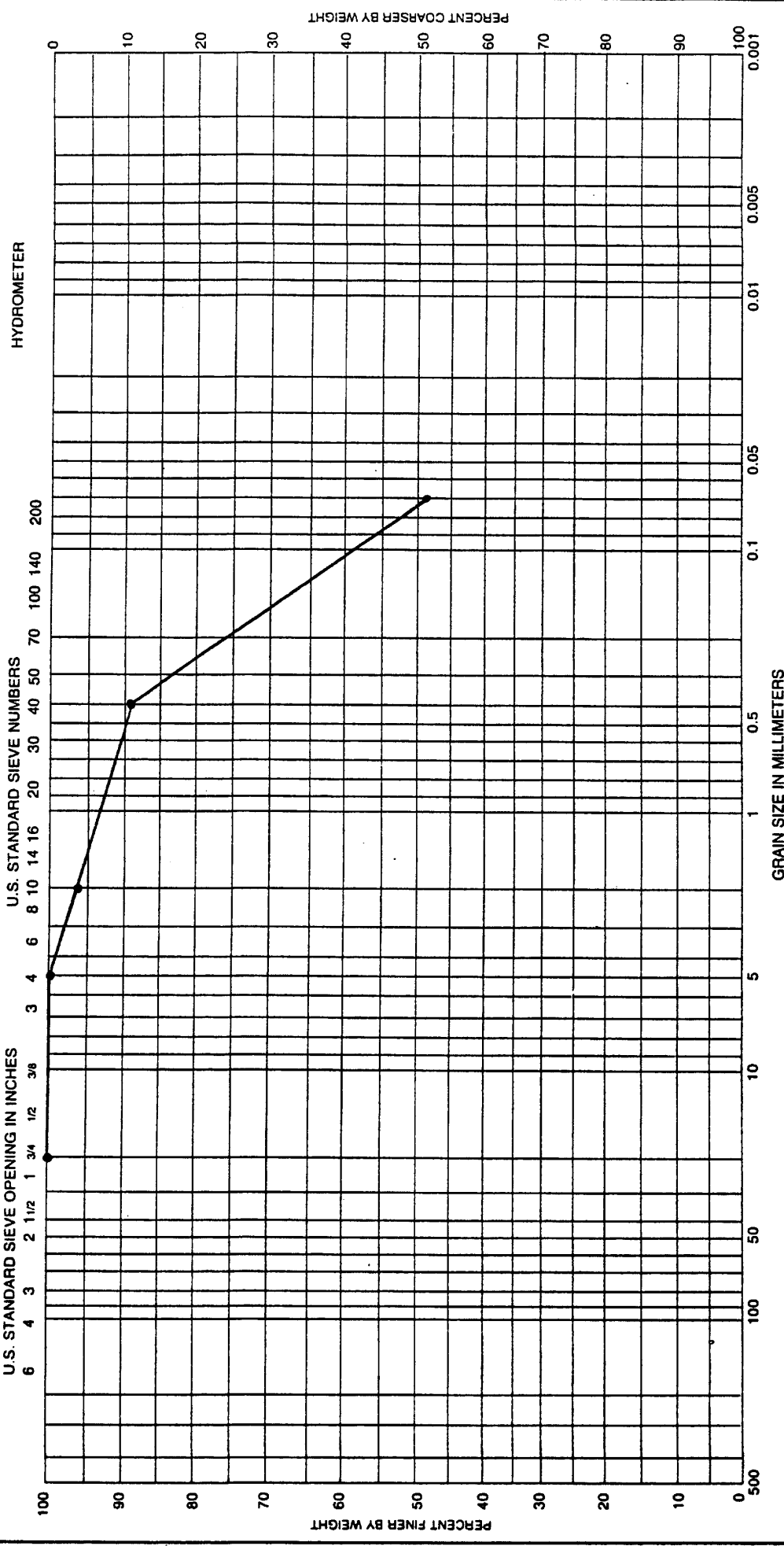
U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

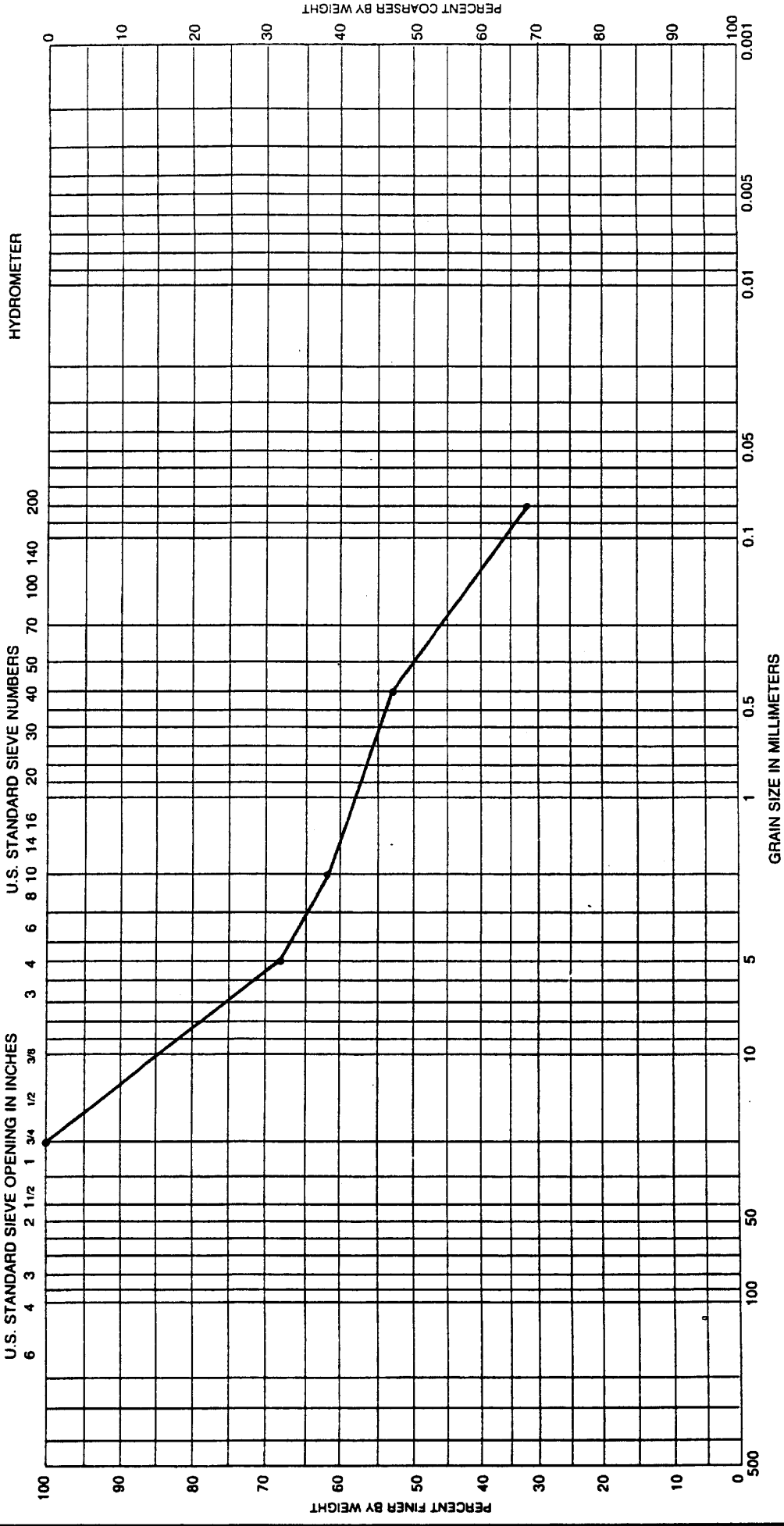


COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
MW-4-13	60'	Clayey Sand: Reddish Tan w/Scattered Calcareous Nodules (10%) Stiff, Dry (SC)		25	15	10
Area		Project Amarillo MSWLF				
Boring No.		MW-4				
Date		8-11-94				
GRADATION CURVES						



COBBLES			GRAVEL			SAND			SILT OR CLAY		
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI					
MW-4 - 14	65'	Clayey Sand : Reddish Tan With Scattered Calcareous Nodules(10%) Stiff, Dry(SC)		25	16	9					
Project <b>Amarillo MSWLF</b>											
Area											
Boring No. <b>MW-4</b>											
Date <b>8-11-94</b>											
<b>GRADATION CURVES</b>											



COBBLES	GRAVEL		SAND			SILT OR CLAY			
	COARSE	FINE	COARSE	NEUTRAL	FINE				
Sample No.	Elev or Depth	Classification				Net w %	LL	PL	PI
MW-4 - 16	75'	Clayey Sand : Reddish Tan with Scattered Calcareous Nodules(10%), Stiff, Dry(SC)					25	16	9

Project Amarillo MSWLF  
 Area  
 Boring No. MW-4  
 Date 8-11-94

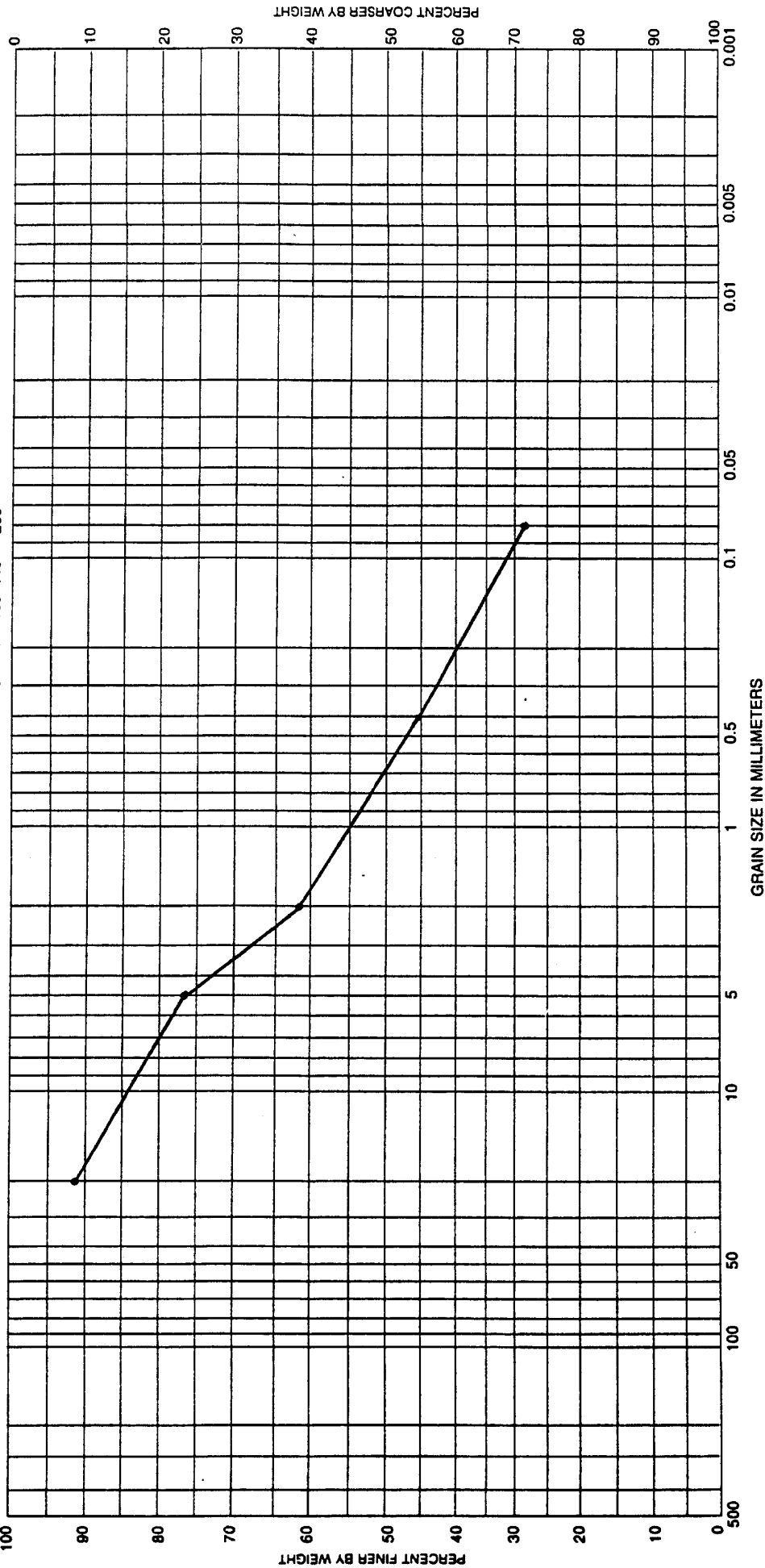
**GRADATION CURVES**



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



COBBLES	GRAVEL	SAND			SILT OR CLAY		
	COARSE	FINE	COARSE	NEUTRAL	FINE		

Sample No.	Elev or Depth	Classification		Net w %	LL	PL	PI
MW-4 - 17	80'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules(10%), Stiff, Dry (SC)			23	19	4

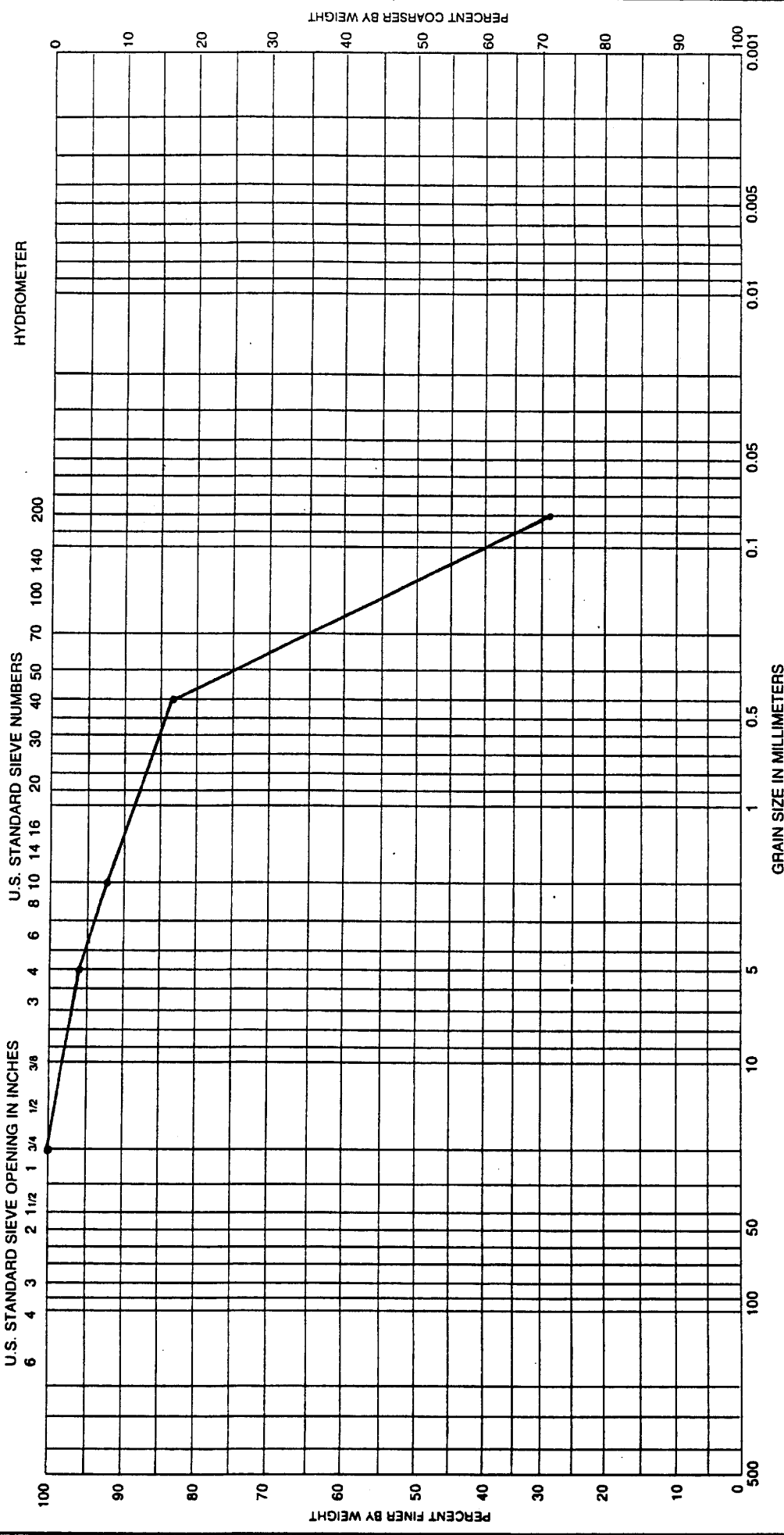
Project **Amarillo MSWLF**

Area

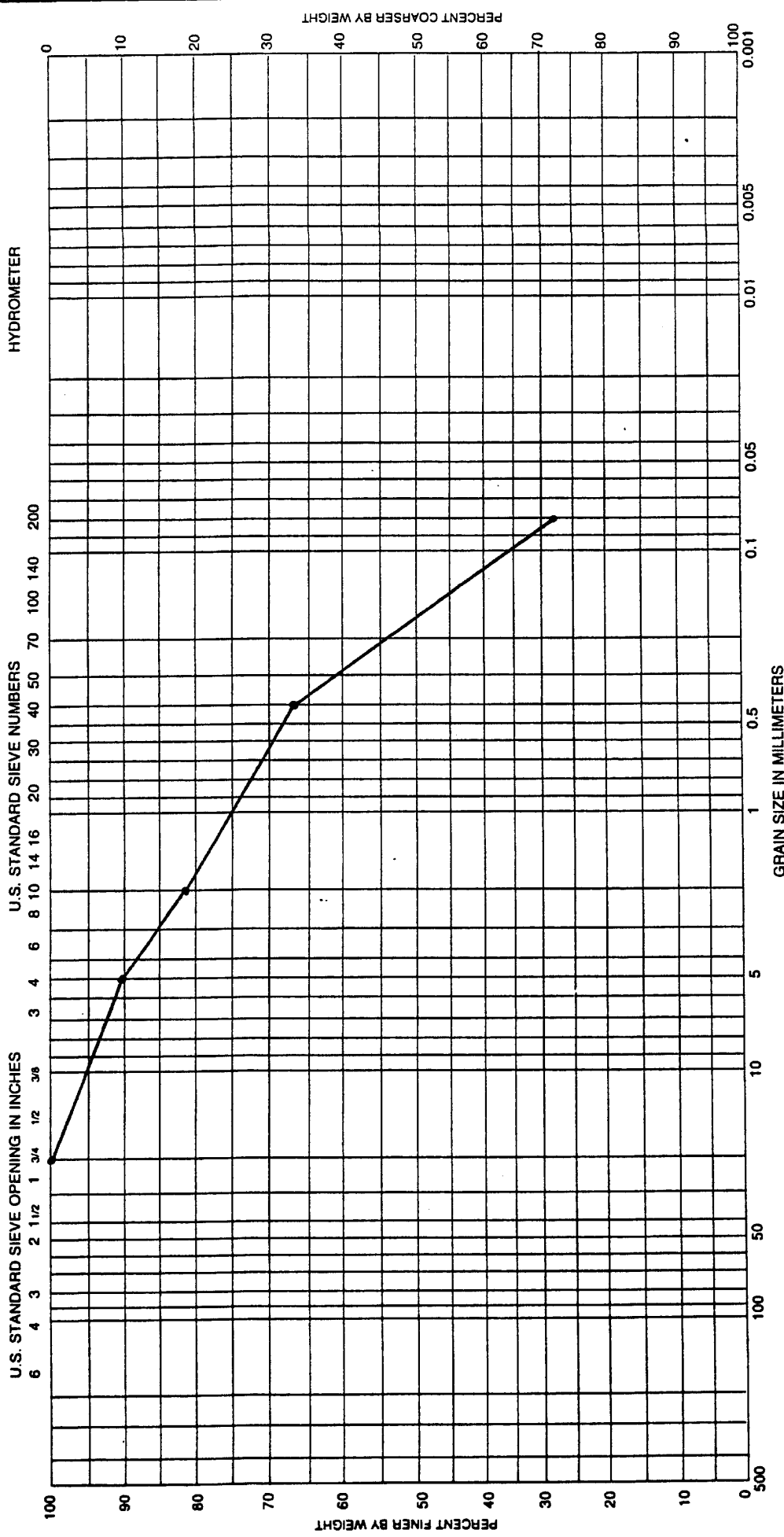
Boring No. **MW-4**

Date **8-11-94**

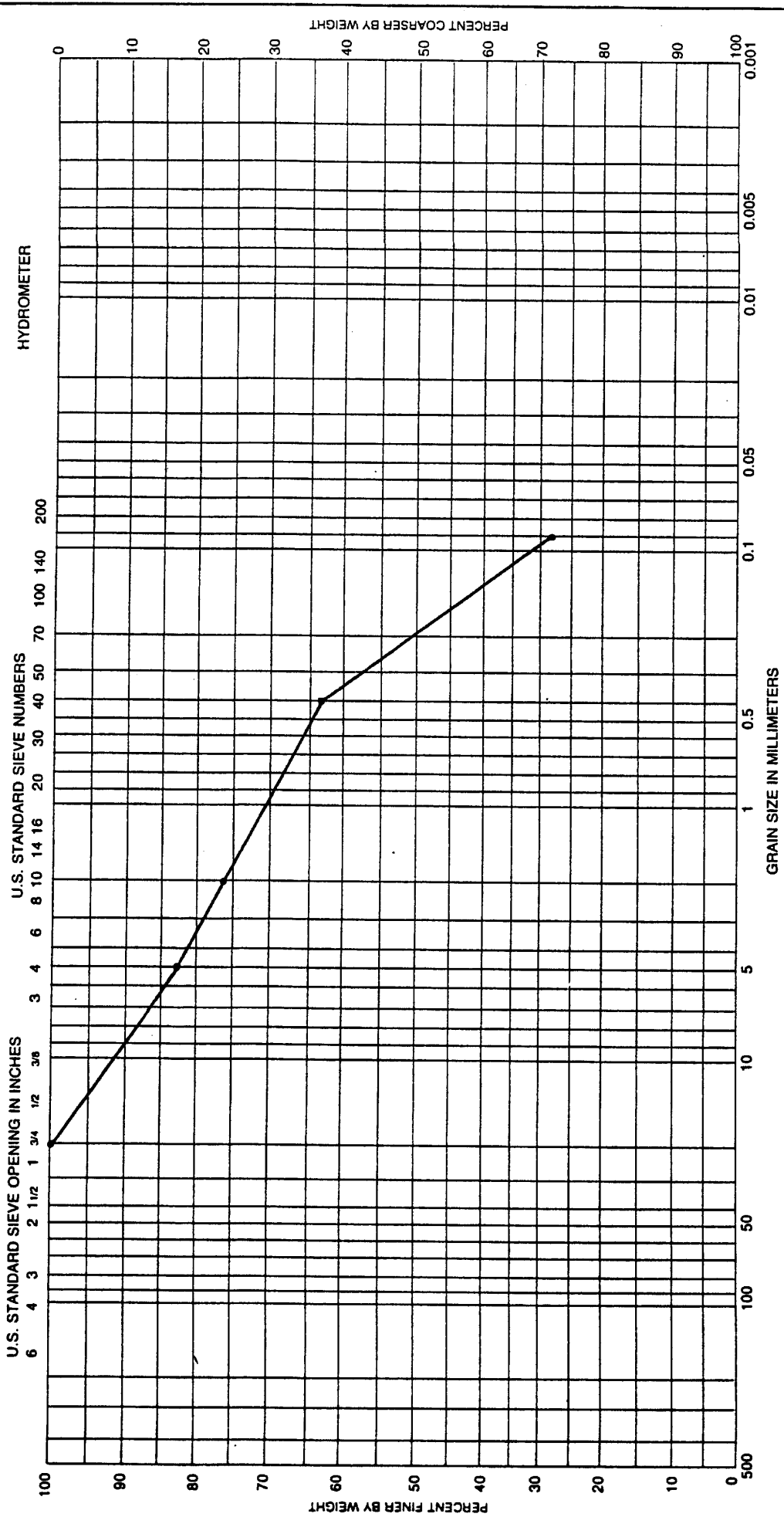
GRADATION CURVES



		GRAVEL		SAND			FINE		SILT OR CLAY	
		COARSE	FINE	NEUTRAL	COARSE	NEUTRAL	FINE	PL	PI	
Sample No.	Elev or Depth	Classification								Project
MW-4 - 18	85'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules(10%), Stiff, Dry (SC)								Amarillo MSWLF
		Net w %								Area
		LL 23								Boring No. MW-4
		PL 14								Date 8-11-94
		PI 9								
GRADATION CURVES										



COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	COARSE	FINE	NEUTRAL	FINE
Sample No.	Elev or Depth	Classification					
MW-4 - 19	90'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules(10%), Stiff, Dry (SC)					
		Net w %	LL	PL	PI		
		24	16	8			
		Project <b>Amarillo MSWLF</b>					
		Area					
		Boring No. <b>MW-4</b>					
		Date <b>8-11-94</b>					
<b>GRADATION CURVES</b>							



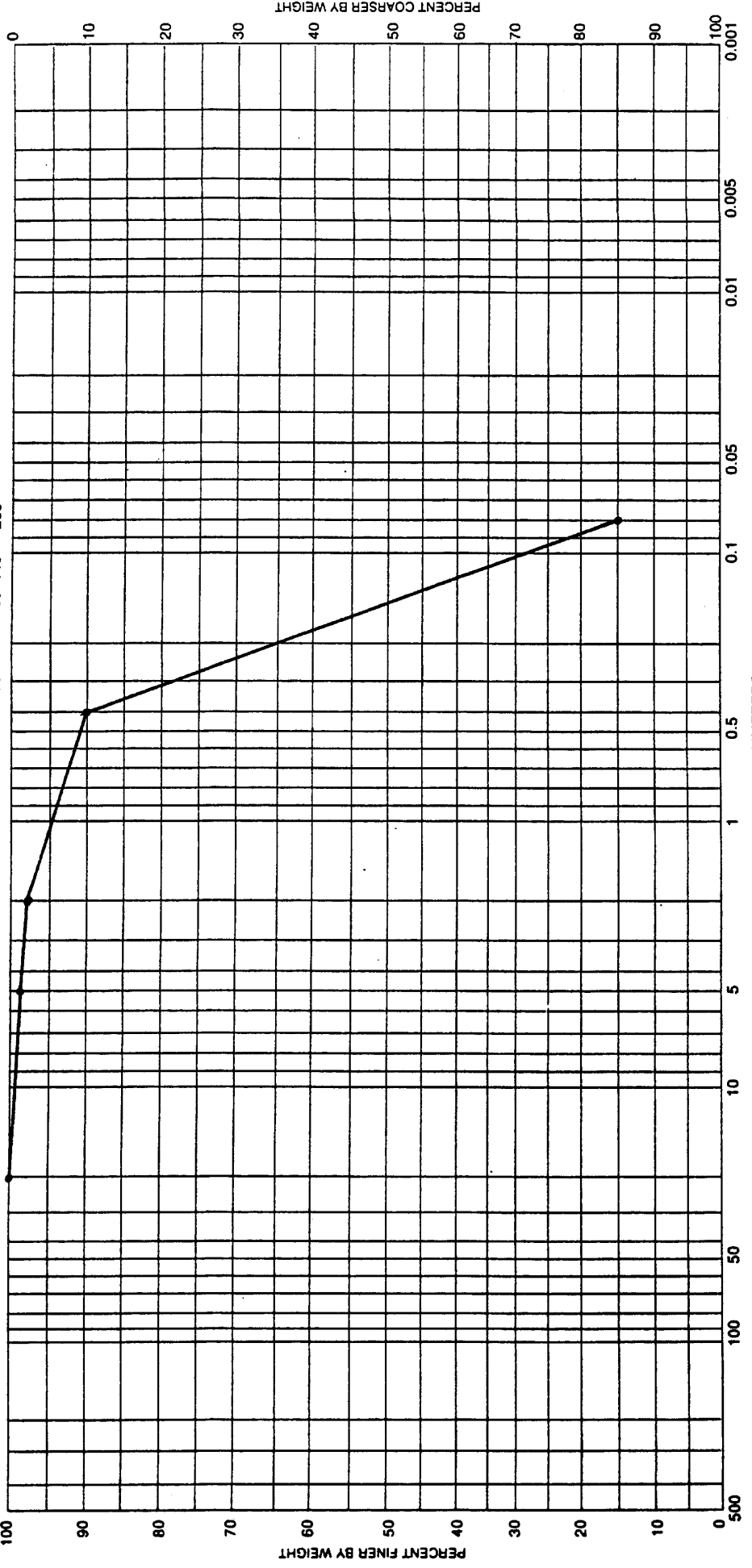
Sample No.	Elev or Depth	Classification	SOIL			PI	Project
			COARSE	FINE	NET WGT		
MW-4 - 20	95'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules(10%), Stiff, Dry(SC)					Amarillo MSWLF
					22		
					15		
					7		

GRADATION CURVES

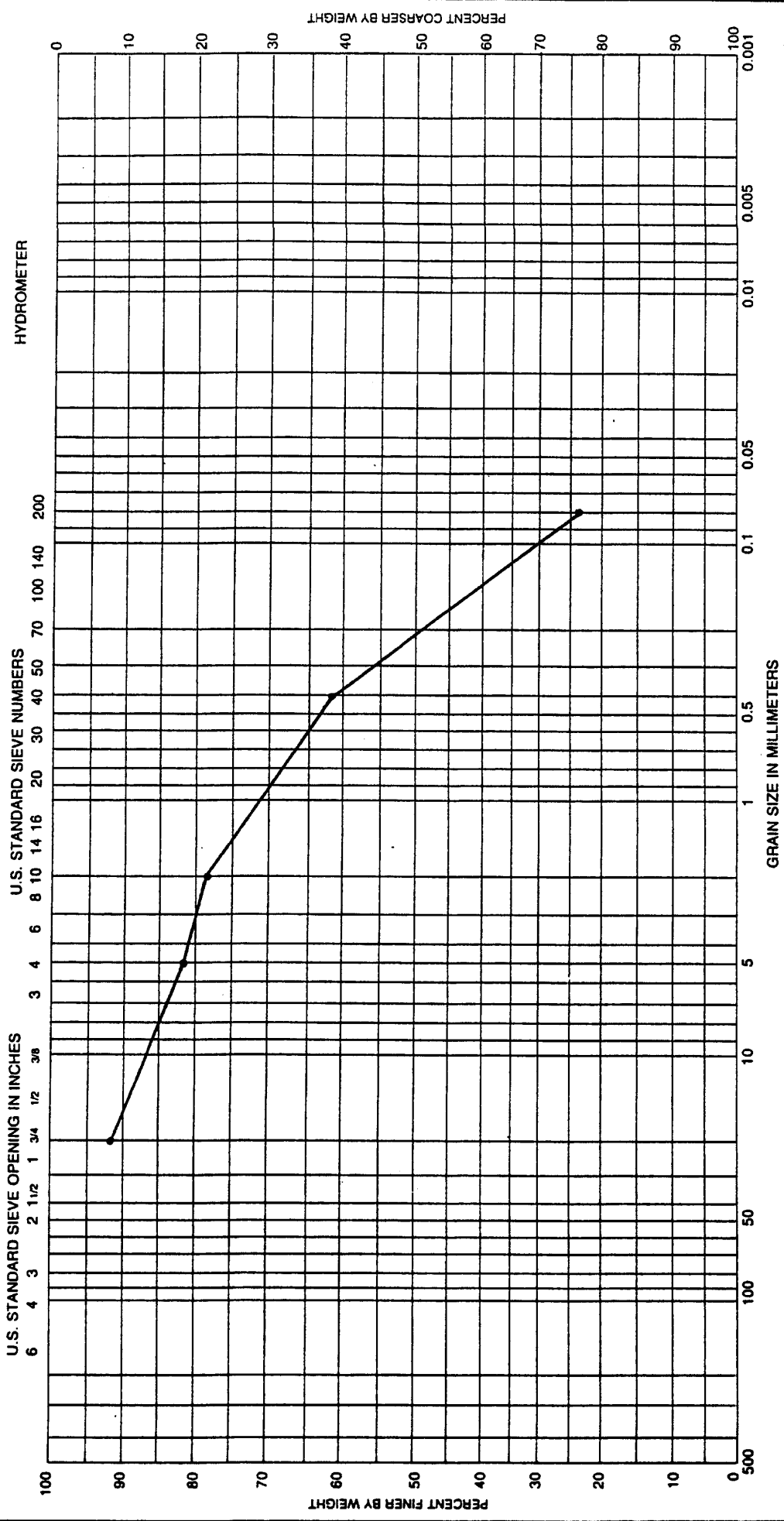
HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

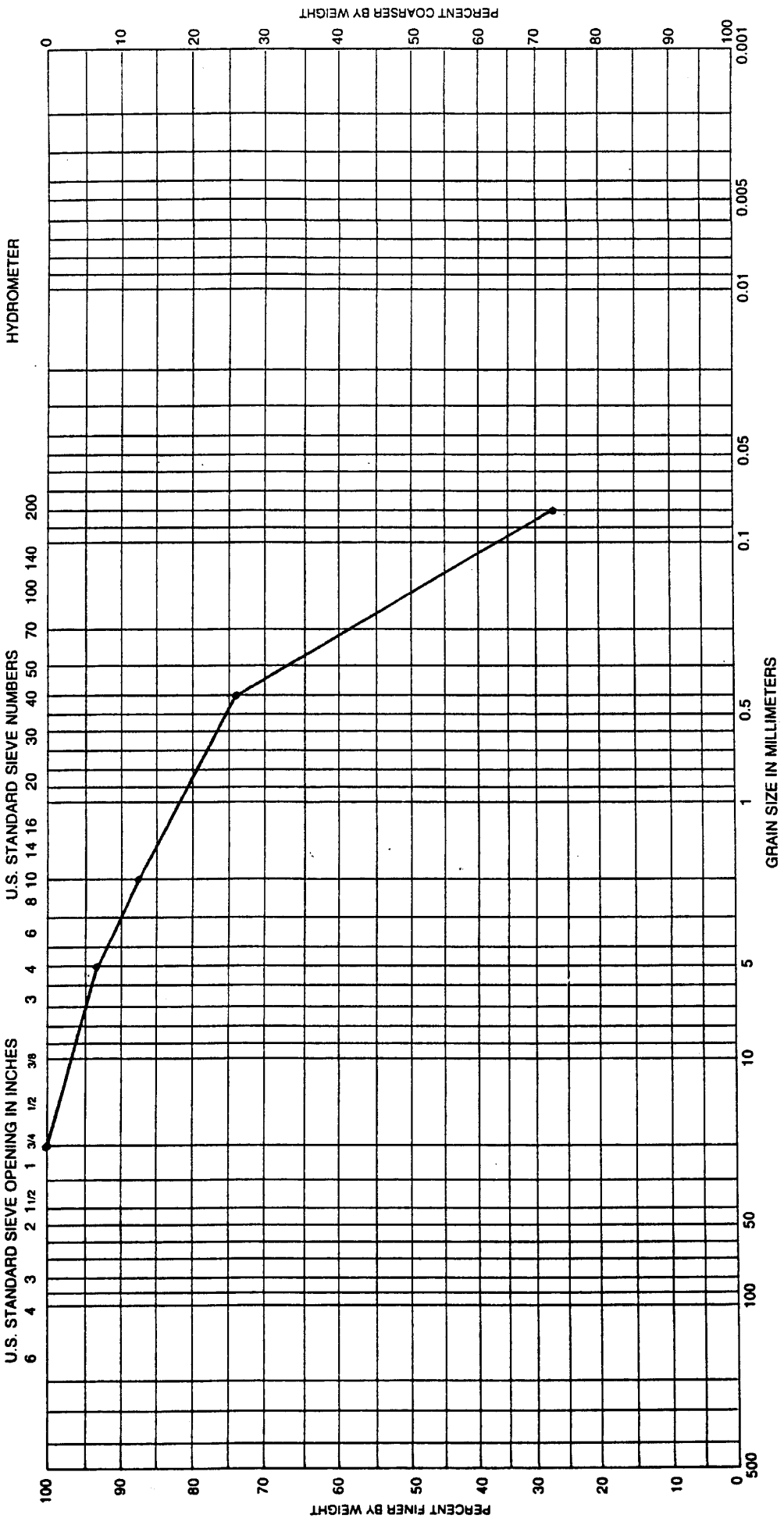


Sample No.	Elev or Depth	Classification				PI		Project	Area	Boring No.	Date		
		COARSE	FINE	COARSE	FINE	Net w %	LL					PL	PI
MW-4 - 21	100'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules(10%), Stiff, Dry (SC)						23	18	5	Amarillo MSWLF	MW-4	8-11-94
GRADATION CURVES													

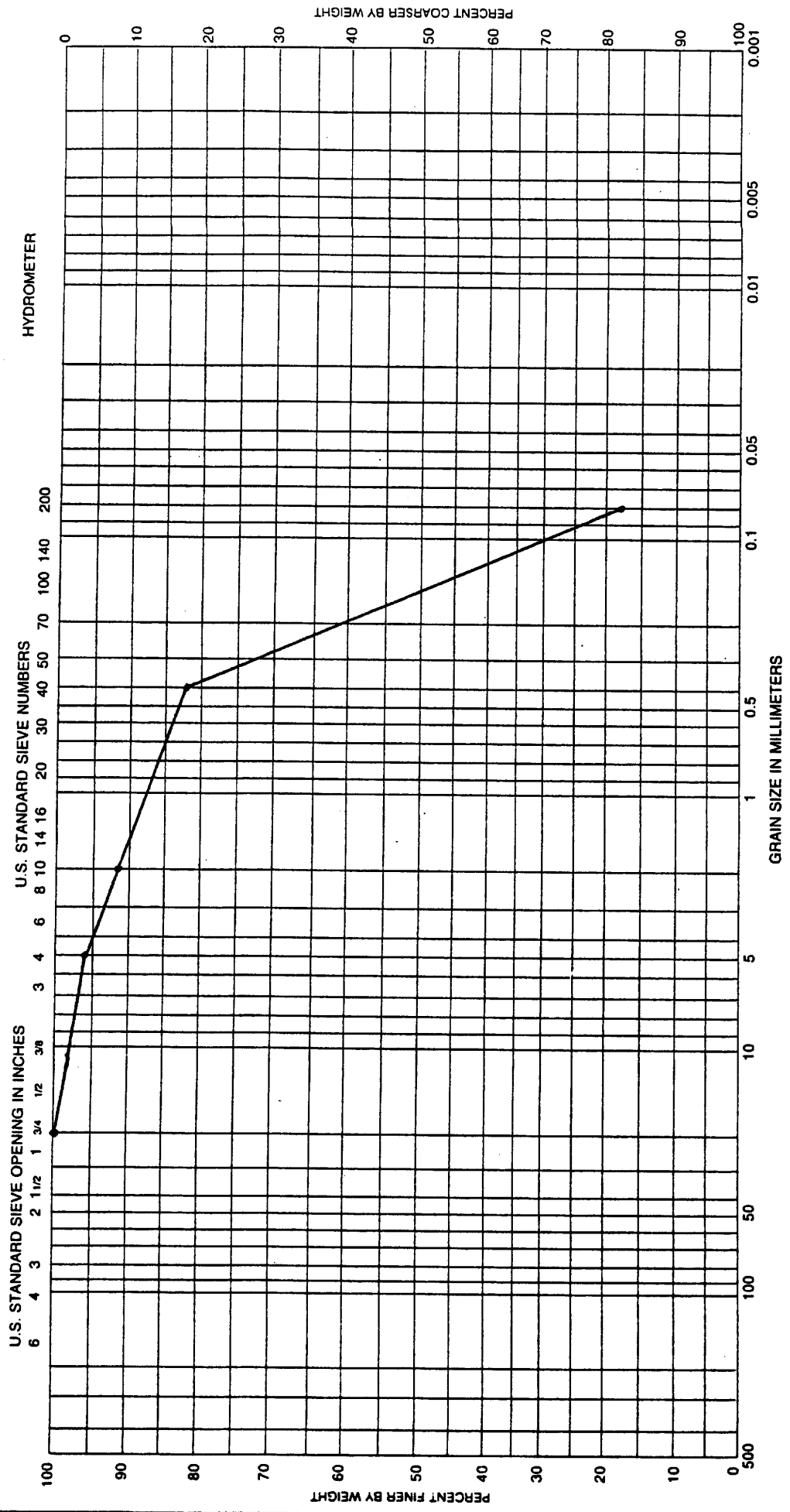


Sample No.	Elev or Depth	Classification				SAND			SILT OR CLAY			
		COARSE	FINE	COARSE	FINE	NEUTRAL	LL	PL	PI	Area	Boring No.	Date
MW-4 - 23	110'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules(10%), Stiff, Dry (SC)									MW-4	8-11-94

GRADATION CURVES

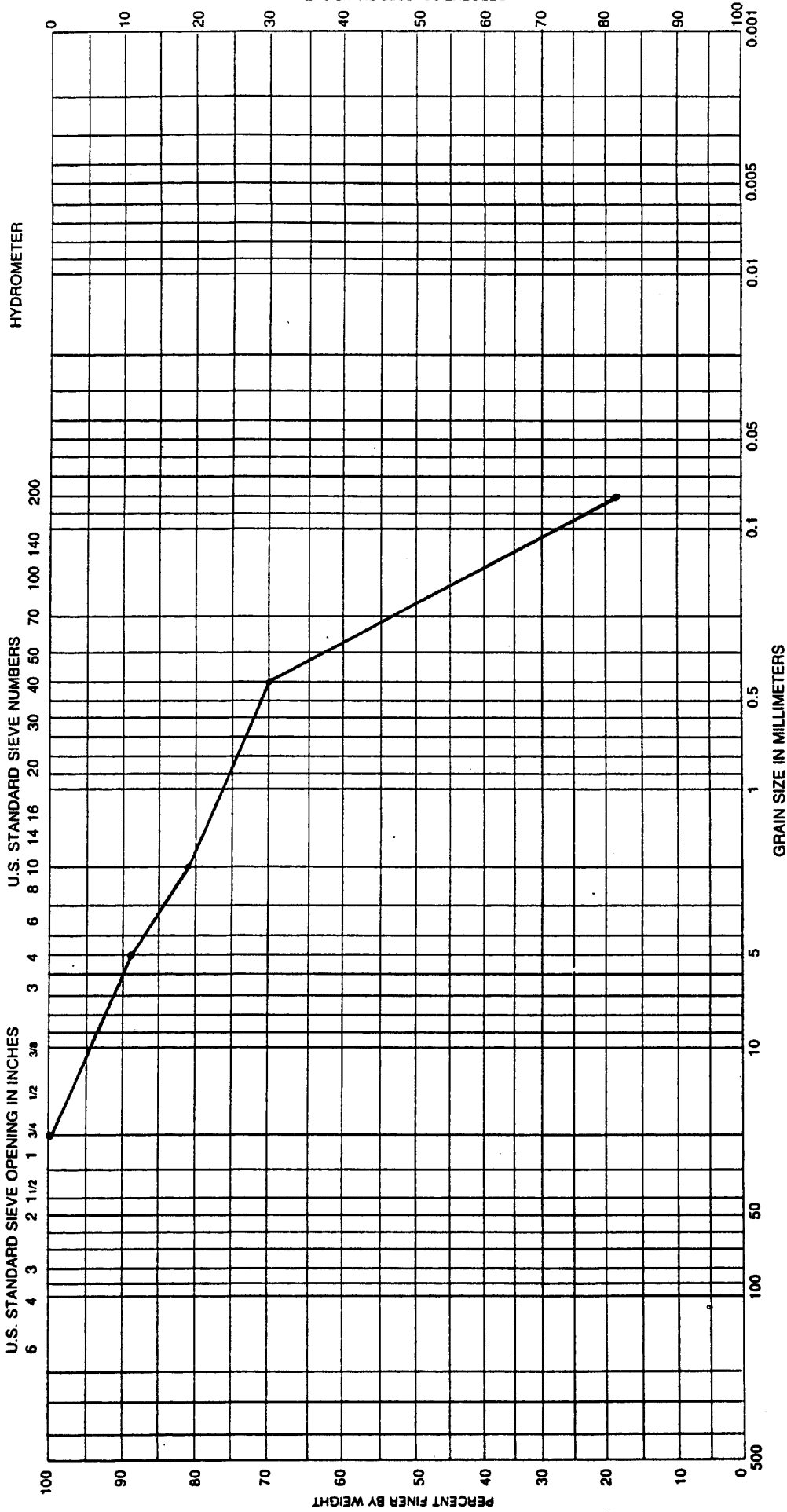


COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	COARSE	FINE	NEUTRAL	FINE
Sample No.	Elev or Depth	Classification					
MW-4 - 25	120'	Clayey Sand; Reddish Tan with Scattered Calcareous Nodules(10%), Stiff, Dry (SC)					
		Net w %	LL	PL	PI		
		Project					
		Amarillo MSWLF					
		Area					
		Boring No. MW-4					
		Date 8-11-94					
GRADATION CURVES							



Sample No.	Elev or Depth	Classification	SAND			PI												
			Net w %	LL	PL													
MW-4 - 27	130'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules(10%), Stiff, Dry (SC)		19	15	4												
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">COBBLES</td> <td style="width:15%;">GRAVEL</td> <td style="width:15%;">SILT OR CLAY</td> </tr> <tr> <td>COARSE</td> <td>FINE</td> <td>COARSE</td> </tr> <tr> <td></td> <td></td> <td>NEUTRAL</td> </tr> <tr> <td></td> <td></td> <td>FINE</td> </tr> </table>							COBBLES	GRAVEL	SILT OR CLAY	COARSE	FINE	COARSE			NEUTRAL			FINE
COBBLES	GRAVEL	SILT OR CLAY																
COARSE	FINE	COARSE																
		NEUTRAL																
		FINE																
<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:20%;">Project</td> <td>Amarillo MSWLF</td> </tr> <tr> <td style="width:20%;">Area</td> <td></td> </tr> <tr> <td style="width:20%;">Boring No.</td> <td>MW-4</td> </tr> <tr> <td style="width:20%;">Date</td> <td>8-11-94</td> </tr> </table>							Project	Amarillo MSWLF	Area		Boring No.	MW-4	Date	8-11-94				
Project	Amarillo MSWLF																	
Area																		
Boring No.	MW-4																	
Date	8-11-94																	
<b>GRADATION CURVES</b>																		

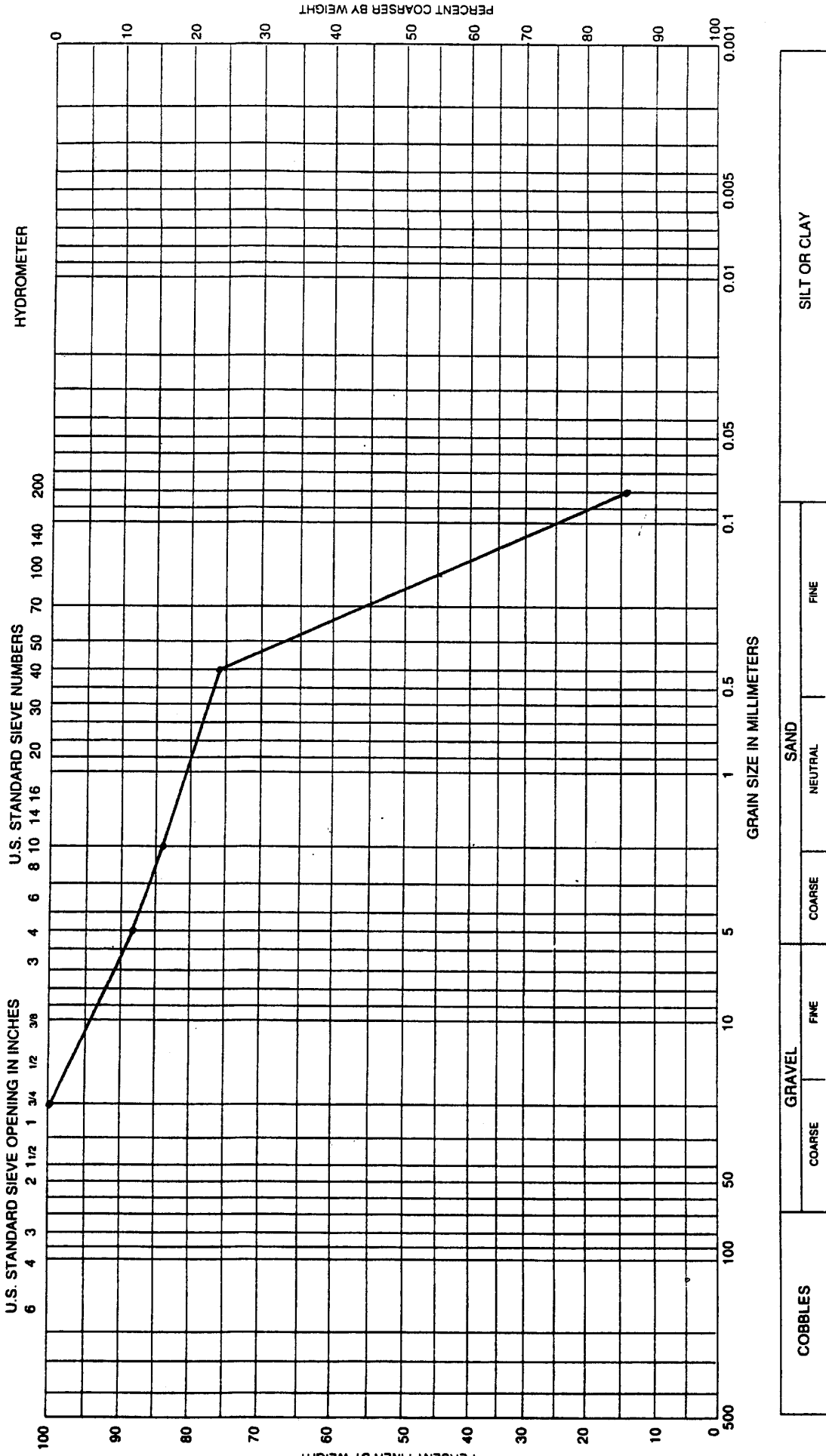




COBBLES		GRAVEL		SAND			SILT OR CLAY	
COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI	
					Net w %			Project
								Amarillo MSWLF
								Area
								Boring No. MW-4
								Date 8-11-94
GRADATION CURVES								

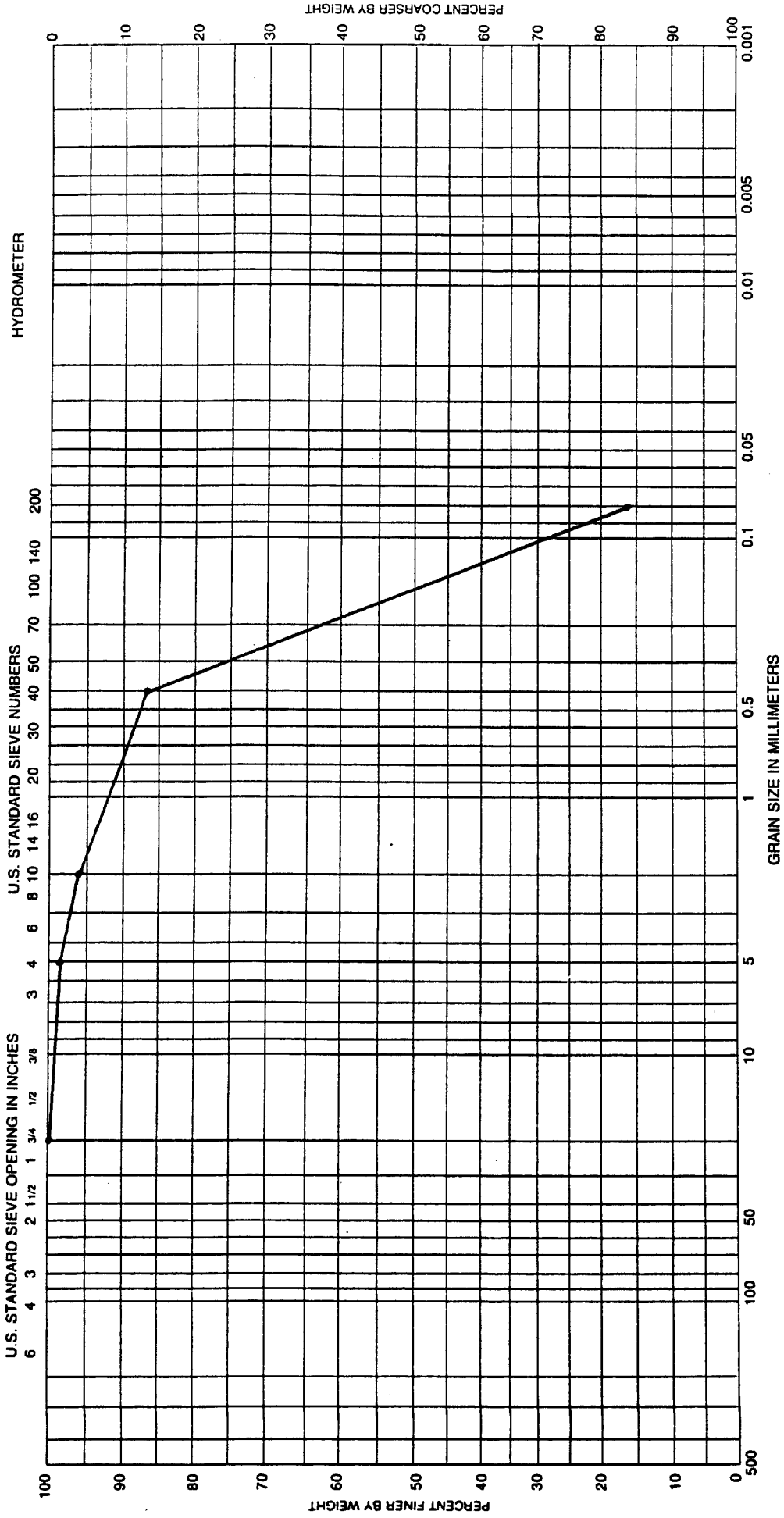
Classification: Clayey Sand: Reddish Tan with Scattered Calcareous Nodules(10%), Stiff, Dry(SC)

Sample No. MW-4 - 29      Elev or Depth 140'



COBBLES	GRAVEL		SAND		SILT OR CLAY	
	COARSE	FINE	COARSE	NEUTRAL	FINE	
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
MW-4 - 31	150'	Sand: Tan With Pea Size Calcareous Nodules (15%) Well Sorted (SC) (R)				
Area		Project				Amarillo MSWLF
Boring No.		MW-4				
Date: 8-11-94						

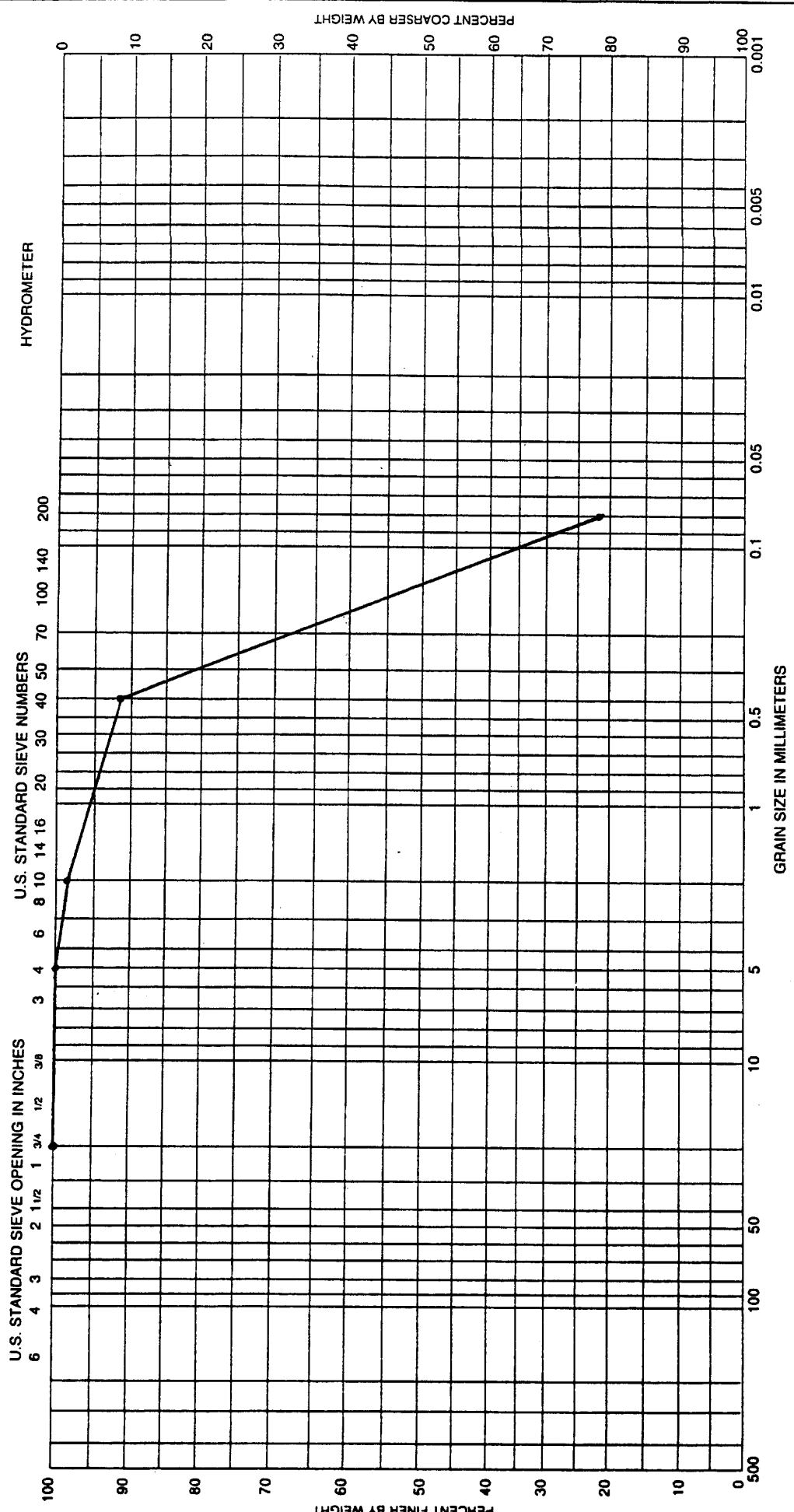
GRADATION CURVES						
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Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-4 - 33	160'	Sand: Tan with Pea Size Calcareous Nodules (15%) Well Sorted (SC) (R)				NP

COBBLES	GRAVEL		SAND		SILT OR CLAY
	COARSE	FINE	COARSE	FINE	
HYDROMETER		Project <b>Amarillo MSWLF</b>			
		Area			
		Boring No. <b>MW-4</b>			
		Date <b>8-11-94</b>			

GRADATION CURVES



Sample No.	Elev or Depth	Classification	Net w %			LL	PL	PI
			COARSE	NEUTRAL	FINE			
MW-4 - 35	170'	Sand: Tan with Scattered Calcareous Nodules (10%) Well Sorted (SC)						
GRADATION CURVES								

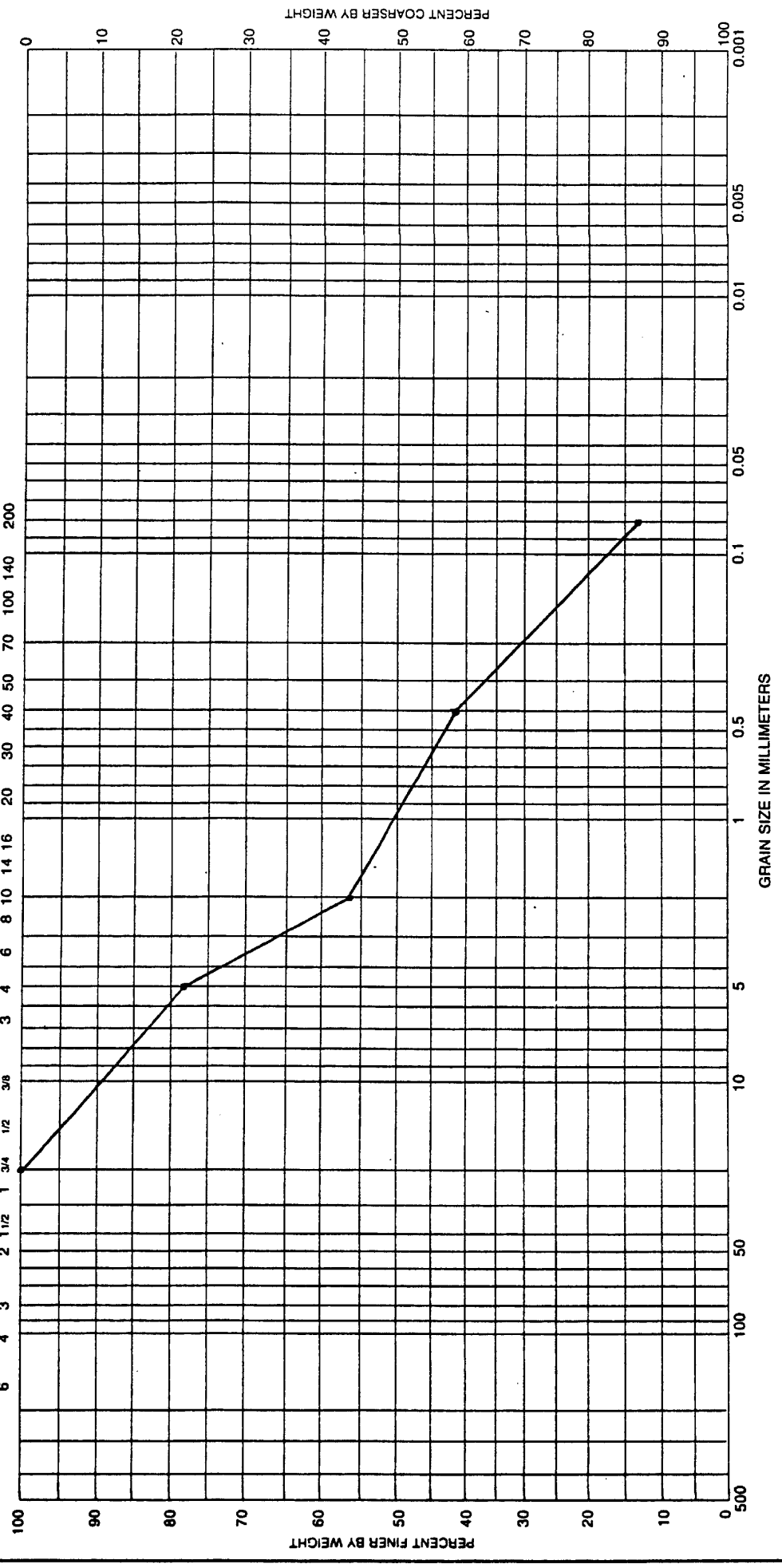
  

COBBLES	GRAVEL	SAND			SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE	

Project	Amarillo MSWLF
Area	
Boring No.	MW-4
Date	8-11-94

HYDROMETER



<b>GRAVEL</b>			<b>SAND</b>			<b>SILT OR CLAY</b>		
COARSE			FINE					
COARSE			NEUTRAL			FINE		
<b>Sample No.</b>	<b>Elev or Depth</b>	<b>Classification</b>		<b>Net w %</b>	<b>PI</b>	<b>PL</b>	<b>NP</b>	
MW-4 - 37	180'	Sand: Reddish Tan with Scattered Calcareous Nodules (SC)						Project Amarillo MSWLF
								Area
								Boring No. MW-4
								Date 8-11-94
<b>GRADATION CURVES</b>								

**LOG OF BORING**

**MW - 5**

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-5  
 LOCATION: Amarillo, Texas

Date: 8-19-94 thru 8-21-94

Ground Elevation: 3736.64

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 115' Mud Drilled to 140'									
			DESCRIPTION OF STRATUM									
0	/ / / / /		Sandy Clay: Reddish Brown w/Calcareous Nodules, Stiff, Dry (CL)									
5	X		Caliche: Light Tan, Limestone Layers, Fractures, Hard (CL)									
			19-6"	7.7		28	25	3			24	
			43-12"									
			50-13.5"									
10	X		Clayey Sand: Reddish Brown with Calcareous Nodules, Stiff, Dry (SC)									
			50-4.5"								4.0	
15	X		Clayey Sand: Reddish Tan with Scattered Calcareous Nodules(SC)									
			50-5"	6.9		25	22	3			34	
20	X		Clayey Sand: Reddish Tan with Scattered Calcareous Nodules(SC)									
			50-2"									
25	X		Clayey Sand: Light Tan with Caliche(Very Hard)(SC)									
			50-5.5"	5.7		18	16	2			22	
30			Continued on Page 2									

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-5  
 LOCATION: Amarillo, Texas

Date: 8-19-94 thru 8-21-94

Ground Elevation: 3736.64

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 115' Mud Drilled to 140'								
			DESCRIPTION OF STRATUM								
30	○	X	K = 7.73 X 10 <sup>-4</sup> cm/sec (R) Clayey Sand: Reddish Tan with Scattered Calcareous Nodules, Dry (SC)	22-6"	5.2		25	21	4		17
				50-11"							
35	○	X		50-3"							
40	○	X		24-6"	6.1		19	16	3		24
				50-11"							
45	○	X		27-6"	5.6				NP		11
				50-10"							
50	○	X	Clayey Sand Reddish Brown Stiff, Dry (SC)	31-6"	4.8				NP		11
				50-9"							
55	○	X	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Dry (SC)	50-6"	4.2		19	16	3		10
60			Continued on Page 3								



## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-5  
 LOCATION: Amarillo, Texas

Date: 8-19-94 thru 8-21-94

Ground Elevation: 3736.64

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 115' Mud Drilled to 140'									
			DESCRIPTION OF STRATUM									
60	○	X	Clayey Sand: Reddish Tan to Tan with Scattered Calcareous Nodules Dry (SC)		50-4"	3.3						
65	○	X			50-6"	4.6		25	22	3		15
70	○	X			34-6"	4.3				NP		24
	○	X			50-7"							
75	○	X			50-5.5"	3.1		28	24	4		14
80	○	X	Gravel: Medium Coarse		50-6"	1.3				NP		2
85	○	X			45-6"	1.9						3
	○	X	Clayey Sand: Reddish Tan to Tan with Coarse Gravel (SC)		50-7"							
90	○	X										

Continued on Page 4

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-5  
 LOCATION: Amarillo, Texas

Date: 8-19-94 thru 8-21-94

Ground Elevation: 3736.64

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary															
			GROUNDWATER INFORMATION: Air Drilled to 115' Mud Drilled to 140'															
			SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE								
DESCRIPTION OF STRATUM																		
90	(Symbol: Diagonal lines with dots)	X	Clayey Sand: Reddish Tan to Tan with Coarse Gravel (SC)															
95	(Symbol: Diagonal lines with dots)																	
100	(Symbol: Diagonal lines with dots)																	
105	(Symbol: Diagonal lines with dots)																	
110	(Symbol: Diagonal lines with dots)	X											16-6"	6.1			NP	85
													50-9"					
115	(Symbol: Diagonal lines with dots)													MD				
120	(Symbol: Diagonal lines with dots)													MD				

Continued on Page 5

## LOG OF BORING

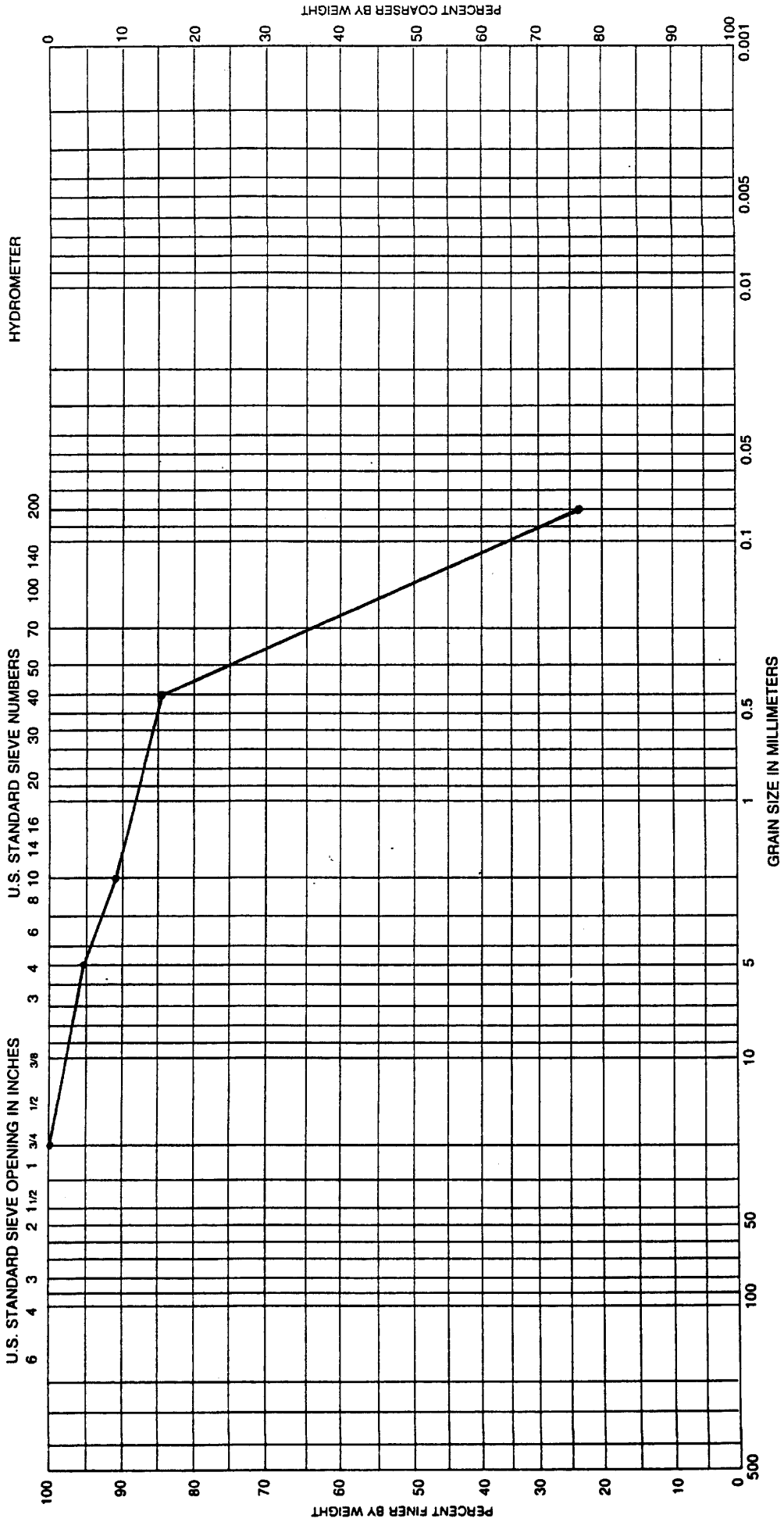
PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: MW-5  
 LOCATION: Amarillo, Texas

Date: 8-19-94 thru 8-21-94

Ground Elevation: 3736.64

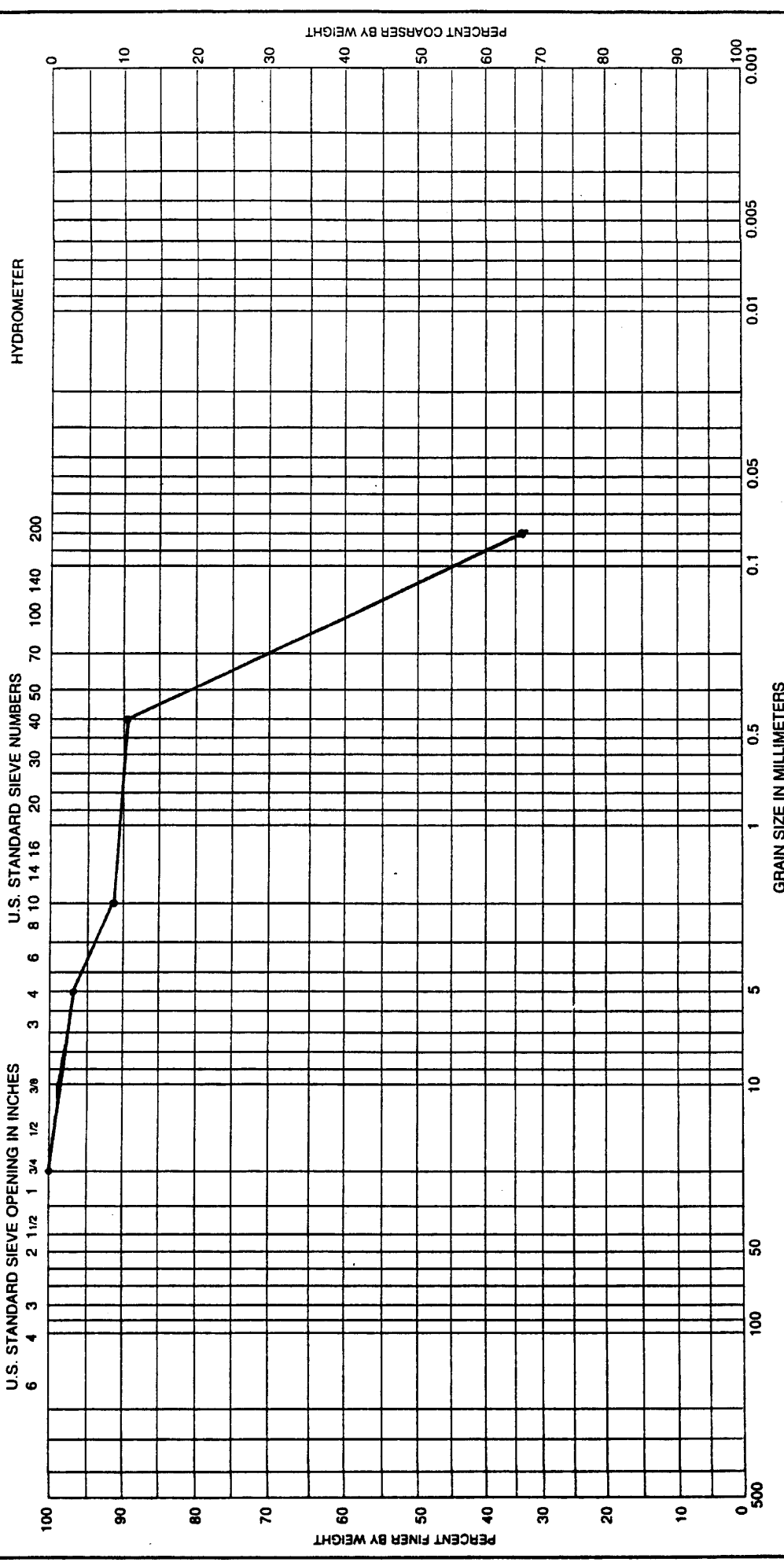
DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 115' Mud Drilled to 140'								
120	[Symbol: Diagonal lines with circles]		Clayey Sand: Reddish Tan to Tan With Coarse Gravel (SC)	MD							
125	[Symbol: Vertical lines]		Silty Clay: Red to Deep Red, Red Bed (MH)	MD							
130	[Symbol: Vertical lines]			MD							
135	[Symbol: Vertical lines]			MD							
140	[Symbol: Vertical lines]			MD							
			* T.D. - 140' *								



COBBLES	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	COARSE	NEUTRAL	FINE		

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
MW-5 - 1	5'	Caliche: Light Tan, Limestone Layers, Fractures Hard (CL)		28	25	3
Area						
Boring No. MW-5						
Date 8-19-94						

GRADATION CURVES



U.S. STANDARD SIEVE OPENING IN INCHES  
 6 4 3 2 1 1/2 1 3/4 1/2 3/8 3/16

U.S. STANDARD SIEVE NUMBERS  
 10 20 30 40 50 70 100 140 200

HYDROMETER

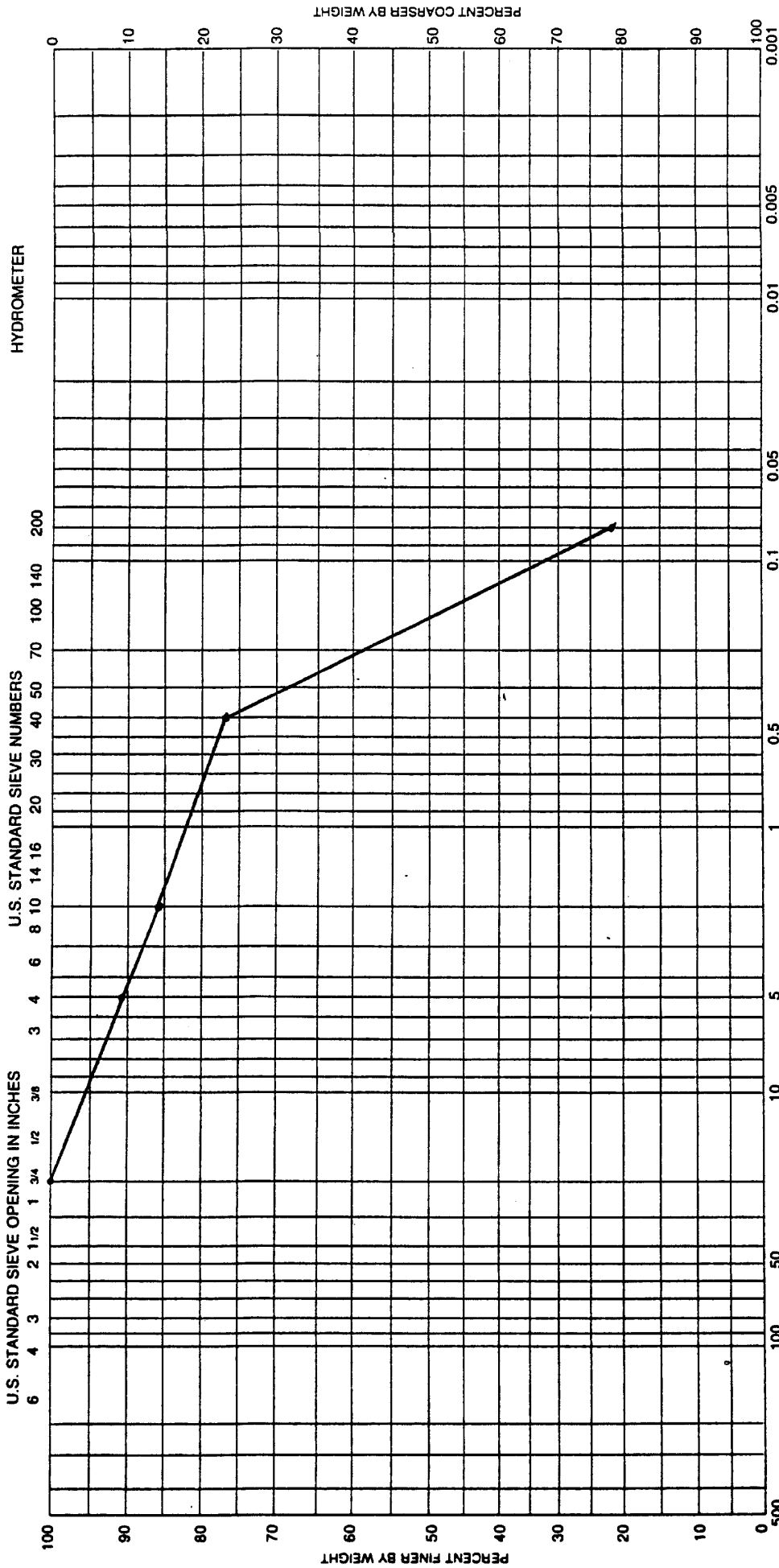
PERCENT FINER BY WEIGHT  
 100  
 90  
 80  
 70  
 60  
 50  
 40  
 30  
 20  
 10  
 0

PERCENT COARSER BY WEIGHT  
 0  
 10  
 20  
 30  
 40  
 50  
 60  
 70  
 80  
 90  
 100

GRAIN SIZE IN MILLIMETERS  
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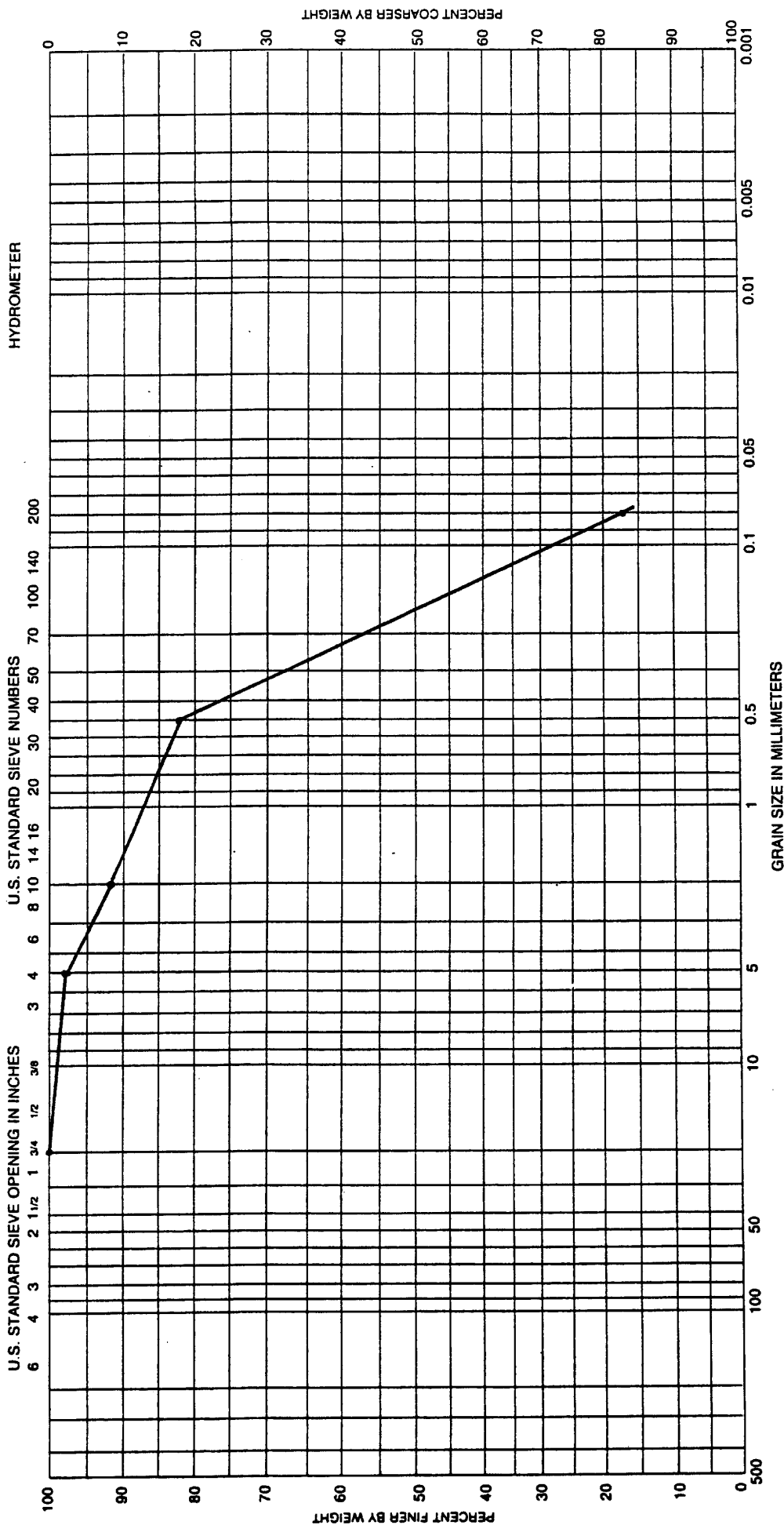
Sample No.	Elev or Depth	Classification				SAND				SILT OR CLAY		
		COARSE	FINE	COARSE	FINE	NETRAL	LL	PL	PI	Area	Boring No.	Date
MW-5 - 2	15'	Clayey Sand: Reddish Brown w/Calcareous Nodules, Stiff Dry (SC)				Net w %	25	22	3	Project		Amarillo MSWLF
									Area		MW-5	
									Boring No.			
									Date		8-19-94	

GRADATION CURVES



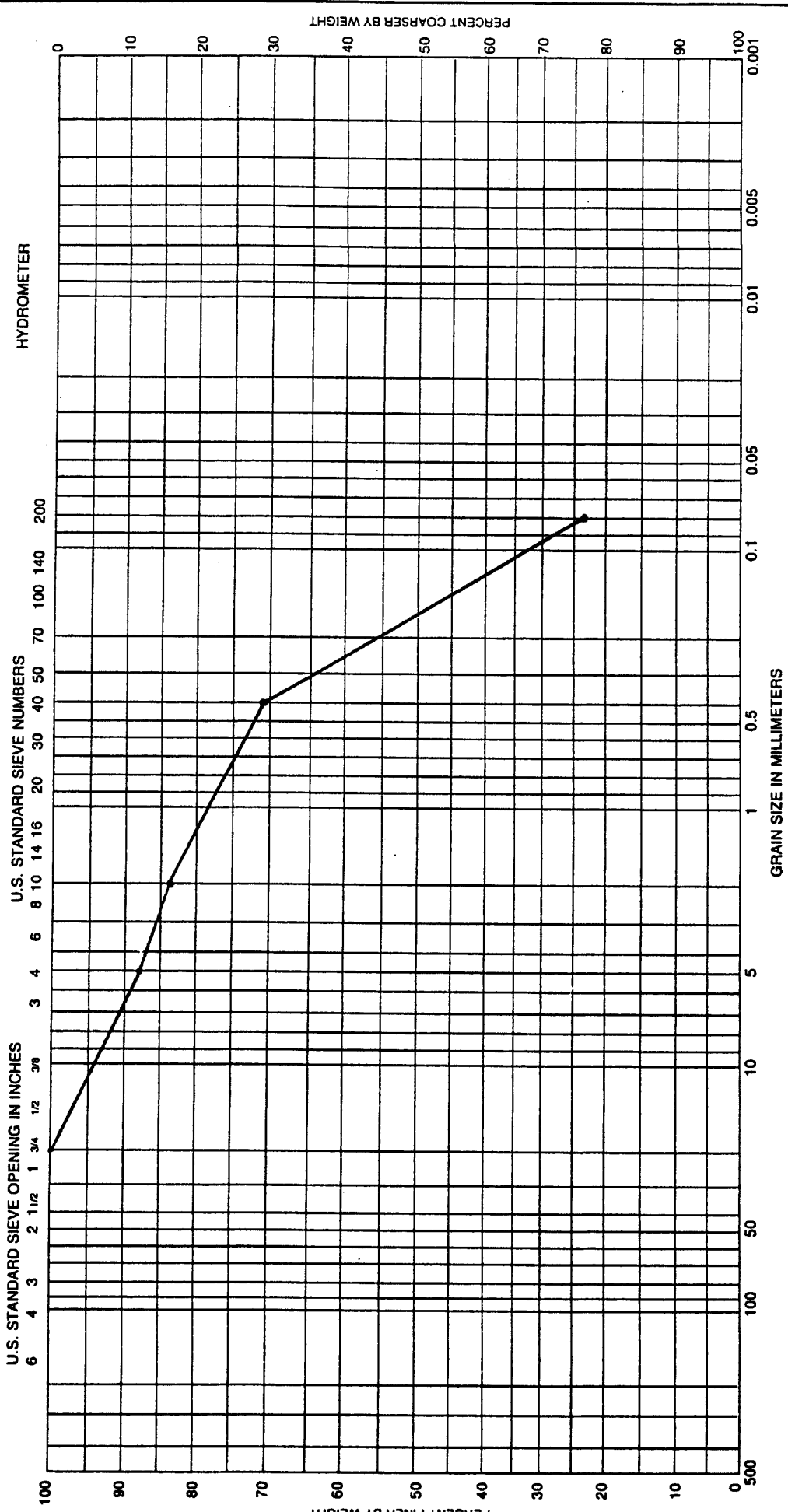
Sample No.	Elev or Depth	GRAVEL			SAND			SILT OR CLAY		
		COARSE	FINE	Classification	NETRAL	FINE	LL	PL	PI	
MW-5 - 3	25'			Clayey Sand: Light Tan with with Caliche(Very Hard)(SC)			18	16	2	
Project <b>Amarillo MSWLF</b>										
Area										
Boring No. <b>MW-5</b>										
Date <b>8-19-94</b>										

GRADATION CURVES



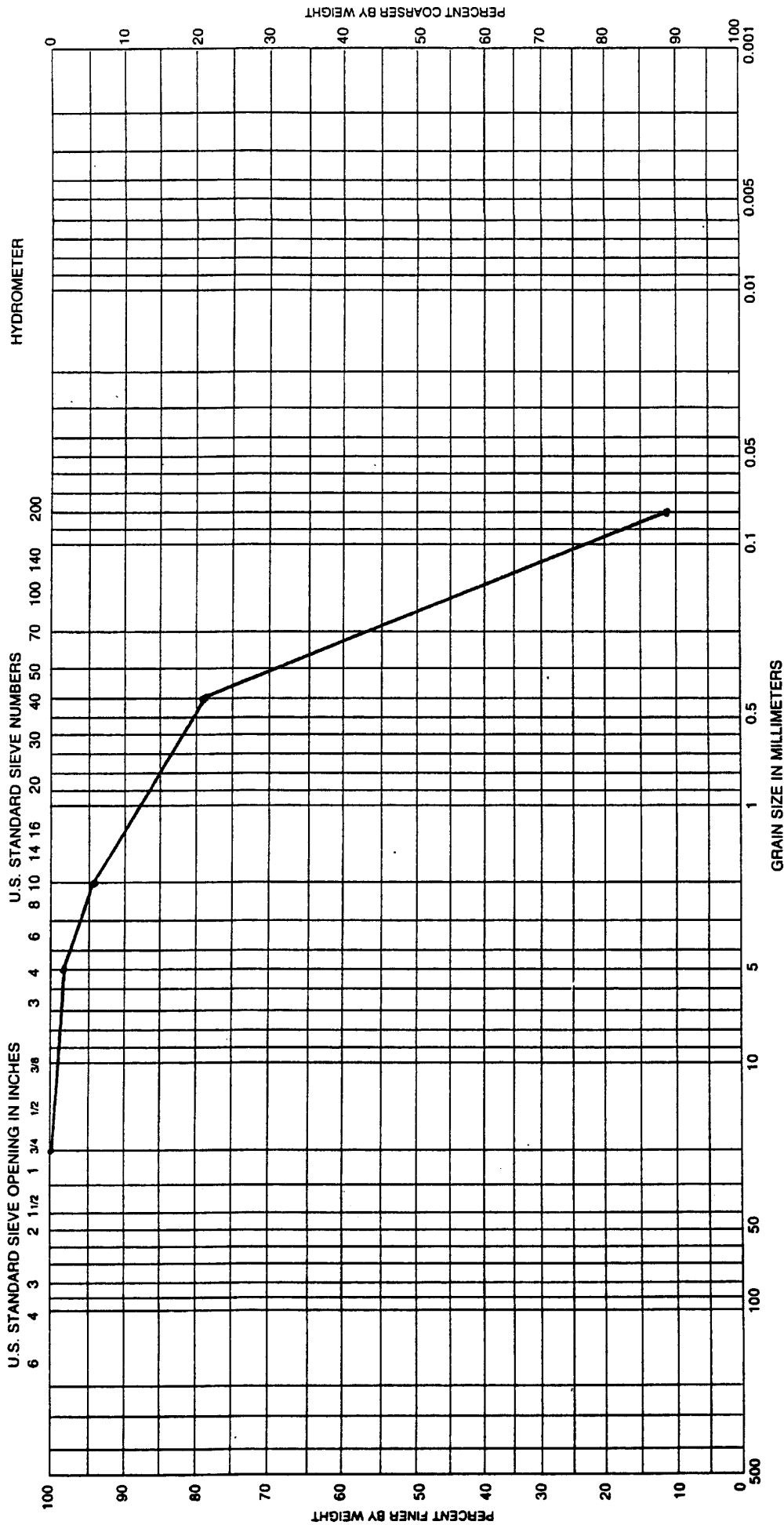
COBBLES		GRAVEL		SAND			SILT OR CLAY			
		COARSE	FINE	COARSE	NEUTRAL	FINE				
Sample No.	Elev of Depth	Classification								PI
MW-5 - 4	30'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules, Dry (SC)								4
		Net w %		LL	PL					
				25	21					
Project										
Amarillo MSWLF										
Area										
Boring No. MW-5										
Date 8-19-94										

**GRADATION CURVES**

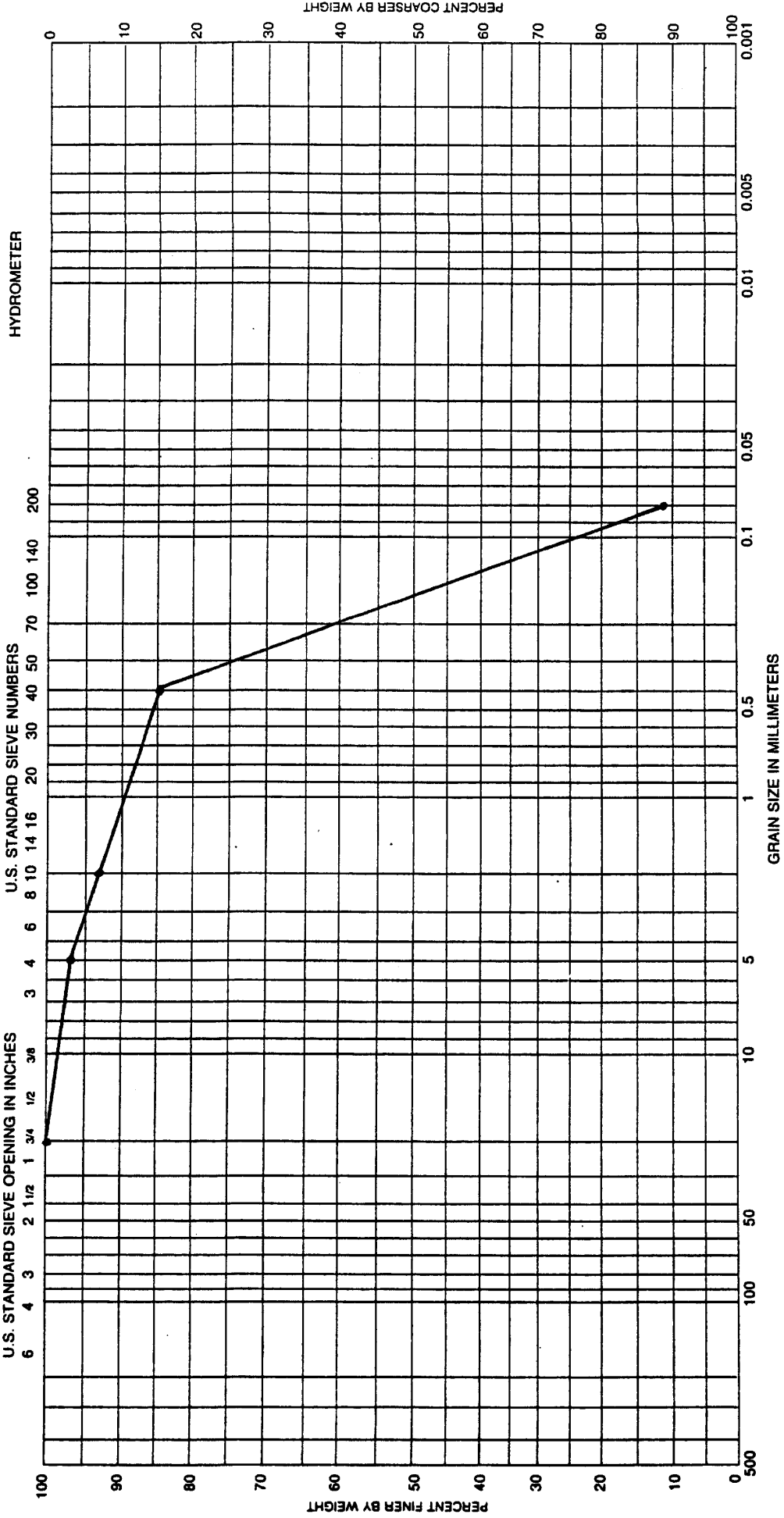


COBBLES		GRAVEL			SAND			SILT OR CLAY		
Sample No.	Elev or Depth	COARSE	FNE	Classification	Net w %	LL	PL	PI		
MW-5 - 5	40'			Clayey Sand: Reddish Tan with Scattered Calcareous Nodules, Dry (CL)		19	16	3	Project	Amarillo MSWLF
									Area	
									Boring No.	MW-5
									Date	8-19-94
<b>GRADATION CURVES</b>										



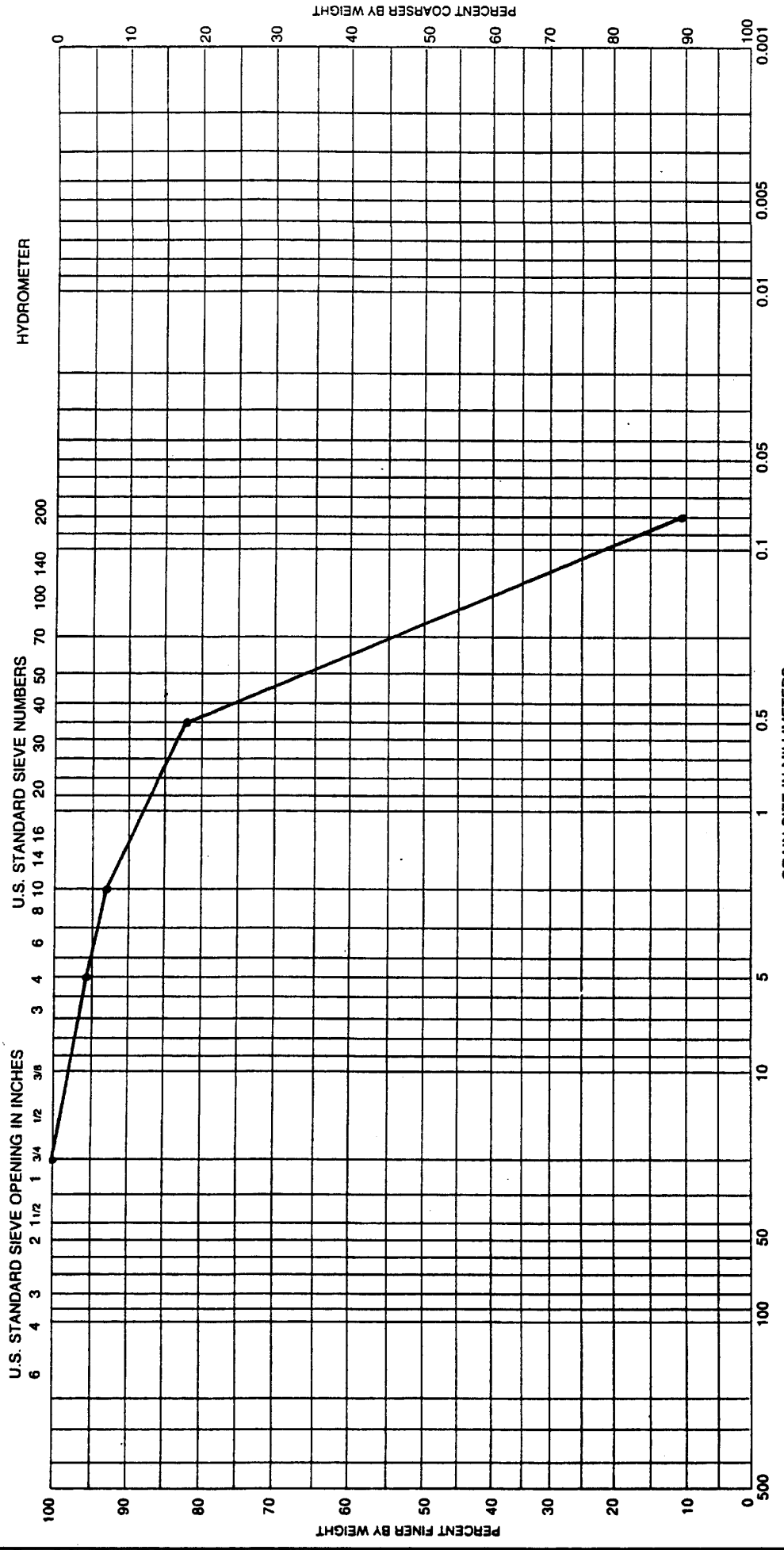


COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	NEUTRAL	FINE		
Sample No.	Elev or Depth	Classification				PI	Project
MW-5 - 6	45'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules, Dry (CL)				NP	Amarillo MSWLF
		Net w %					Area
							MW-5
							Boring No.
							Date
							8-19-94
<b>GRADATION CURVES</b>							

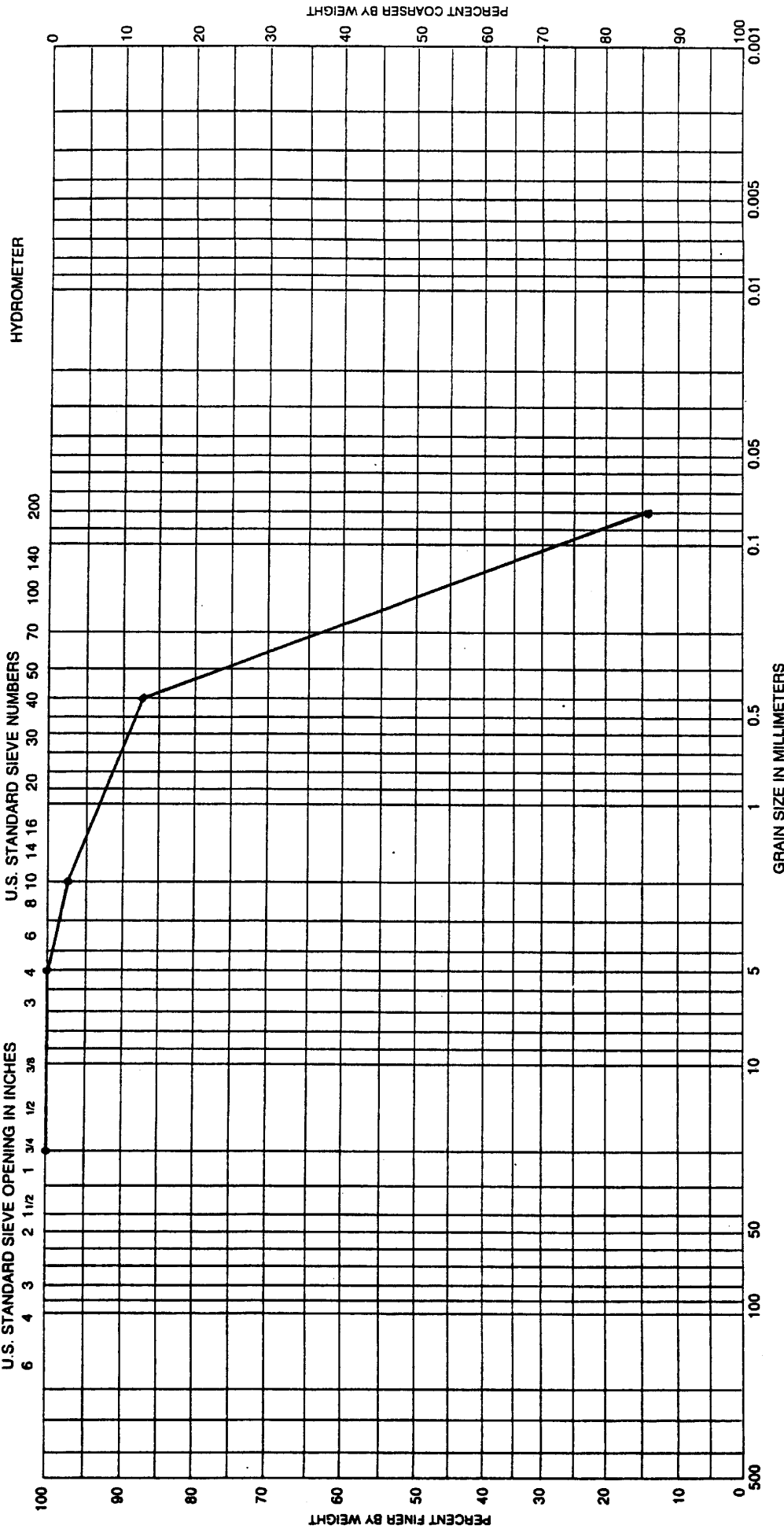


COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	COARSE	FINE	NEUTRAL	FINE
Sample No.	Elev or Depth	Classification				PI	Project
MW-5 - 7	50'	Clayey Sand : Reddish Brown Stiff, Dry (SC)				NP	Amarillo MSWLF
							Area .
							Boring No. MW-5
							Date 8-19-94

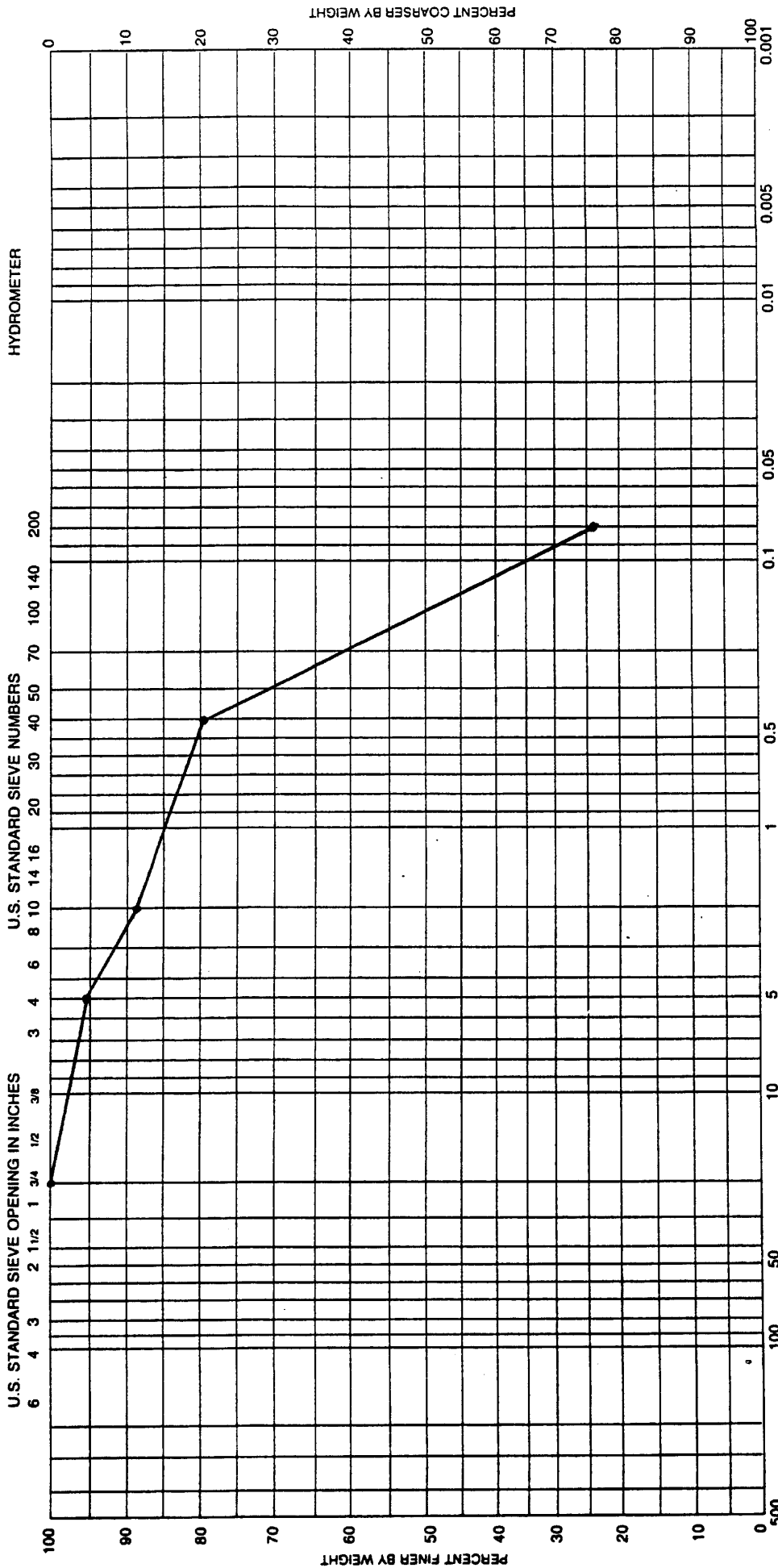
**GRADATION CURVES**



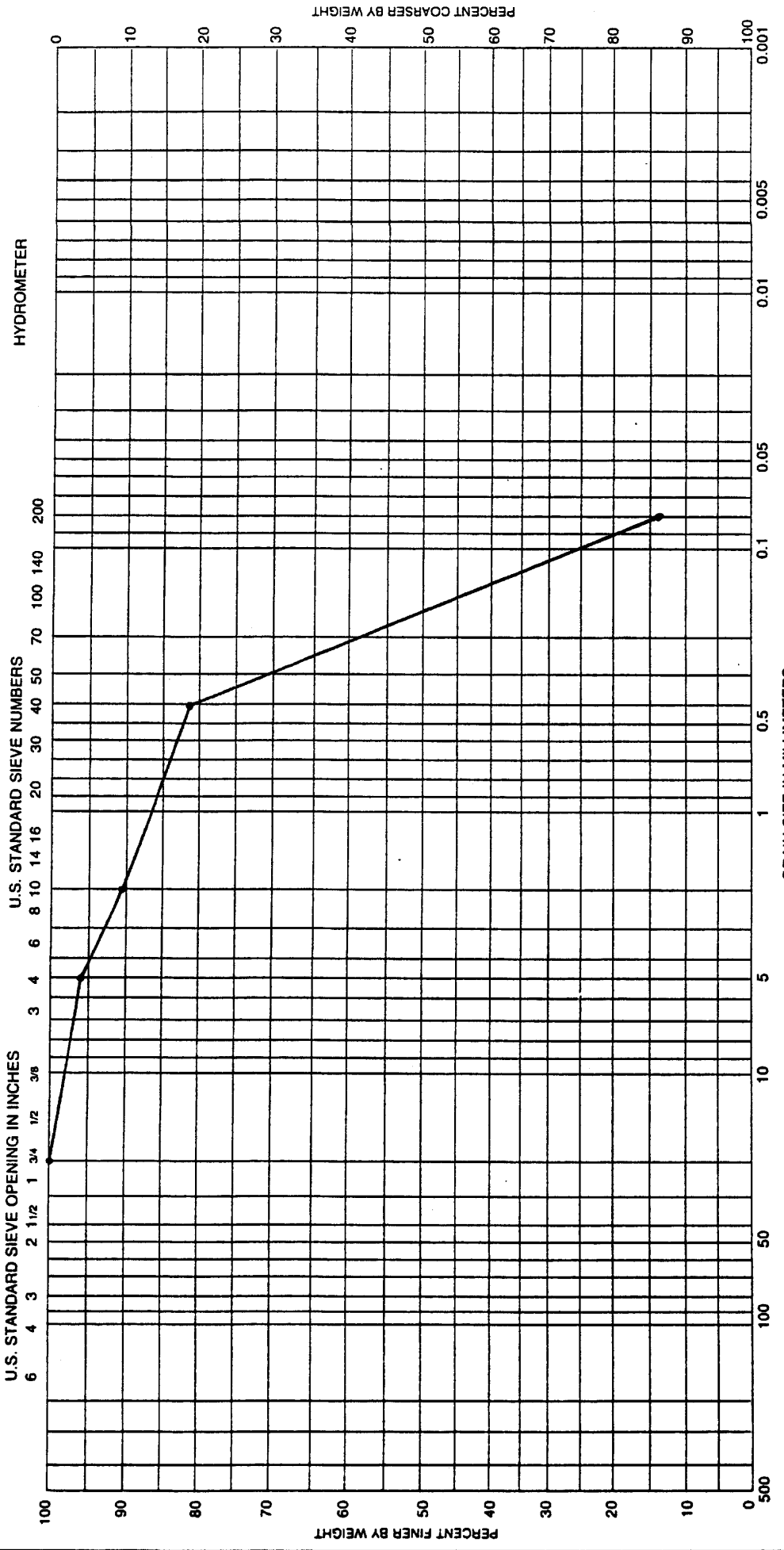
Sample No.	Elev or Depth	Classification				SAND			SILT OR CLAY				
		COARSE	FINE	COARSE	FINE	NETRAL	LL	PL	PI	Area	Boring No.	Date	
MW-5 - 8	55'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules, Dry (SC)						19	16	3	Amarillo MSWLF	MW-5	8-19-94
GRADATION CURVES													



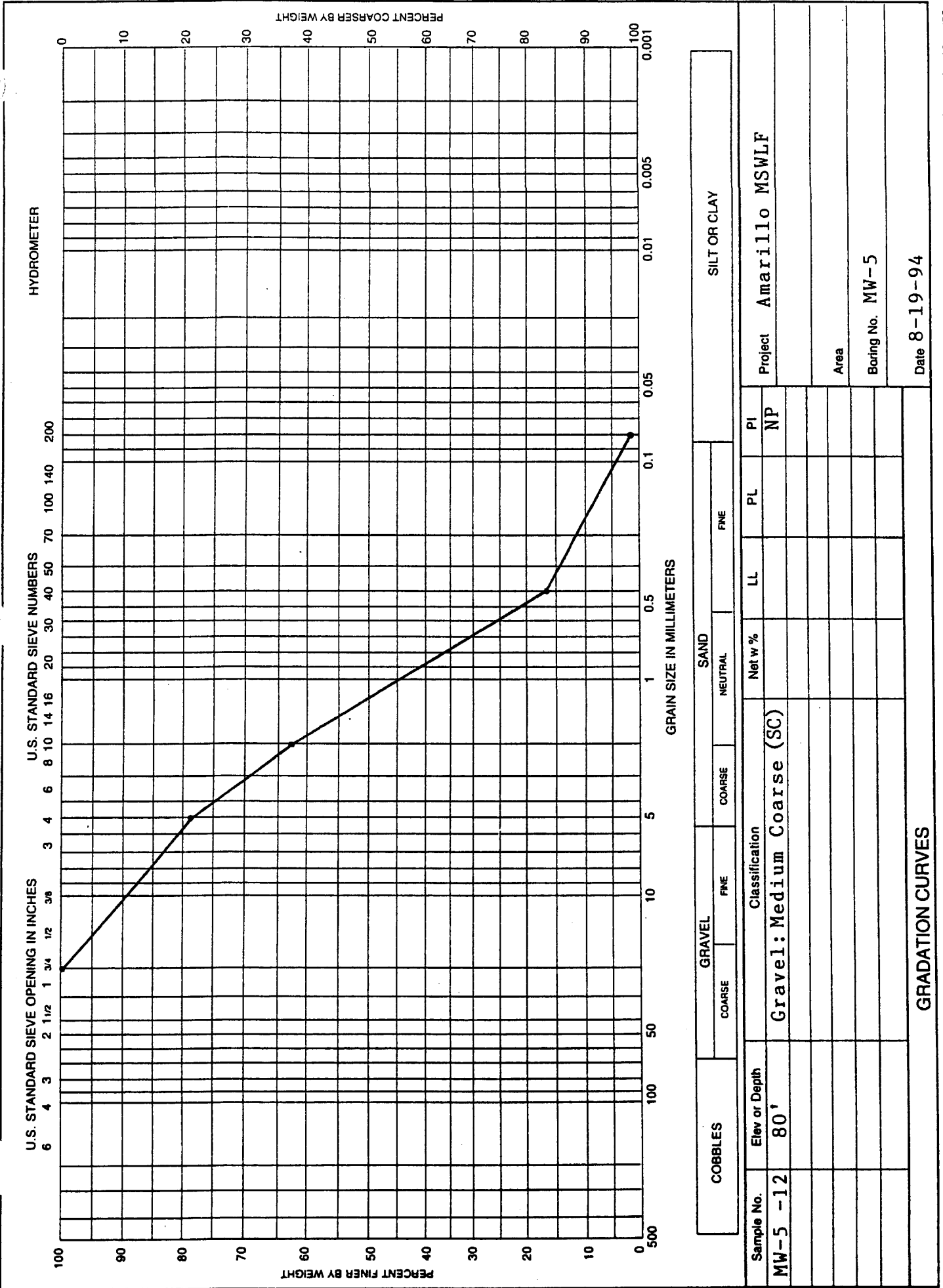
COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	FINE	
Sample No.	Elev or Depth	Classification					
MW-5 - 9	65'	Clayey Sand: Reddish Tan to Tan with Scattered Calcareous Nodules, Dry(SC)					
		Net w %	LL	PL	PI	Project	
			25	22	3	Amarillo MSWLF	
						Area	
						Boring No. MW-5	
						Date 8-19-94	
GRADATION CURVES							



GRAVEL				SAND			SILT OR CLAY	
COARSE		FINE		NEUTRAL		FINE		
COBBLES		Classification		Net w %		PI		Project
Sample No.	Elev or Depth	Clayey Sand: Reddish Tan to Tan with Scattered Calcareous Nodules. Dry(SC)				NP		Amarillo MSWLF
MW-5 - 10	70'							Area
								Boring No. MW-5
								Date
								8-19-94
<b>GRADATION CURVES</b>								



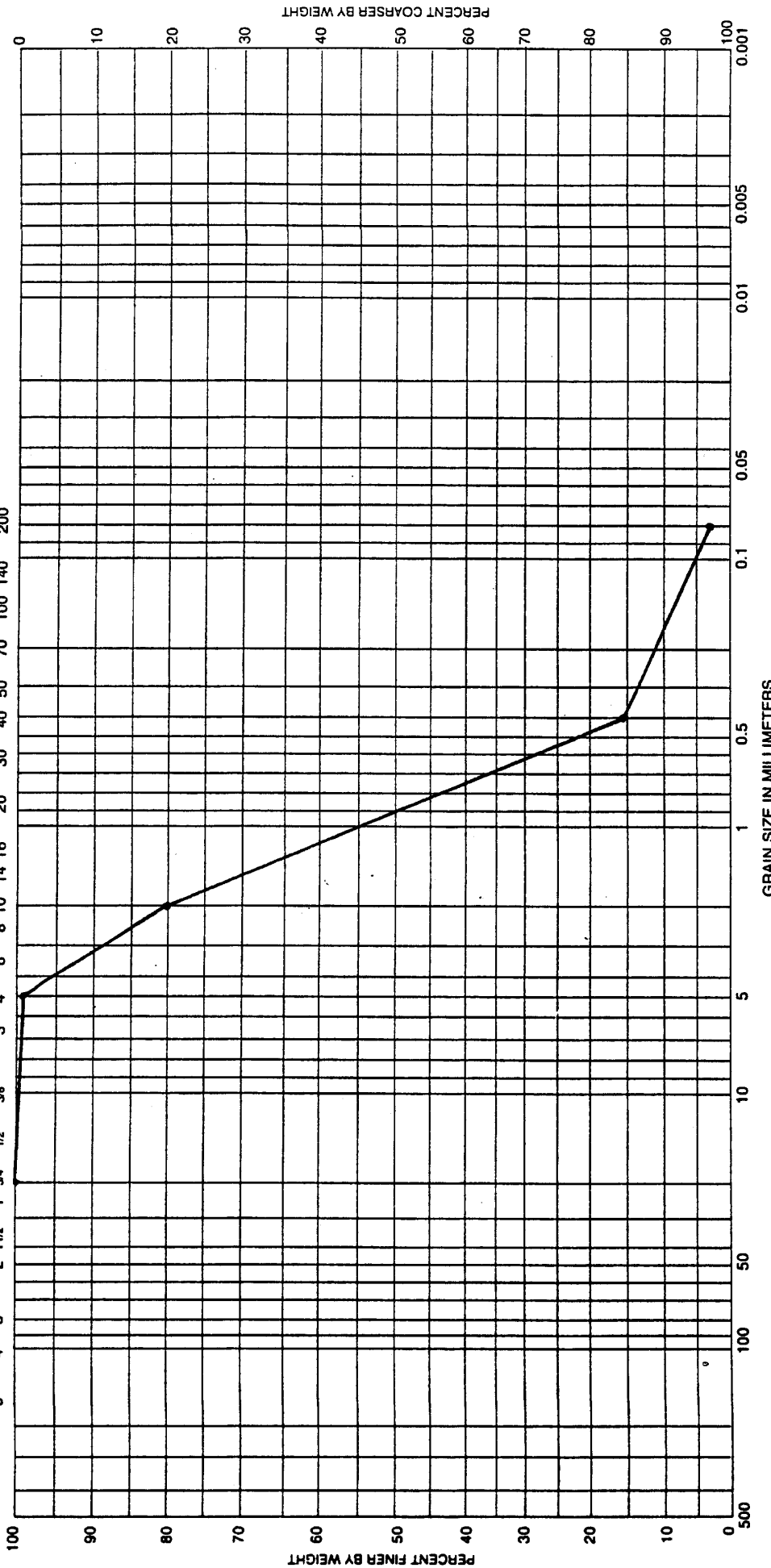
COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	FINE	
Sample No.	Elev or Depth	Classification					
MW-5 -11	75'	Clayey Sand: Reddish Tan to Tan with Scattered Calcareous Nodules, Dry(SC)					
		Net w %	LL	PL	PI		
			28	24	4		
Project <b>Amarillo MSWLF</b>							
Area							
Boring No. <b>MW-5</b>							
Date <b>8-19-94</b>							
<b>GRADATION CURVES</b>							



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

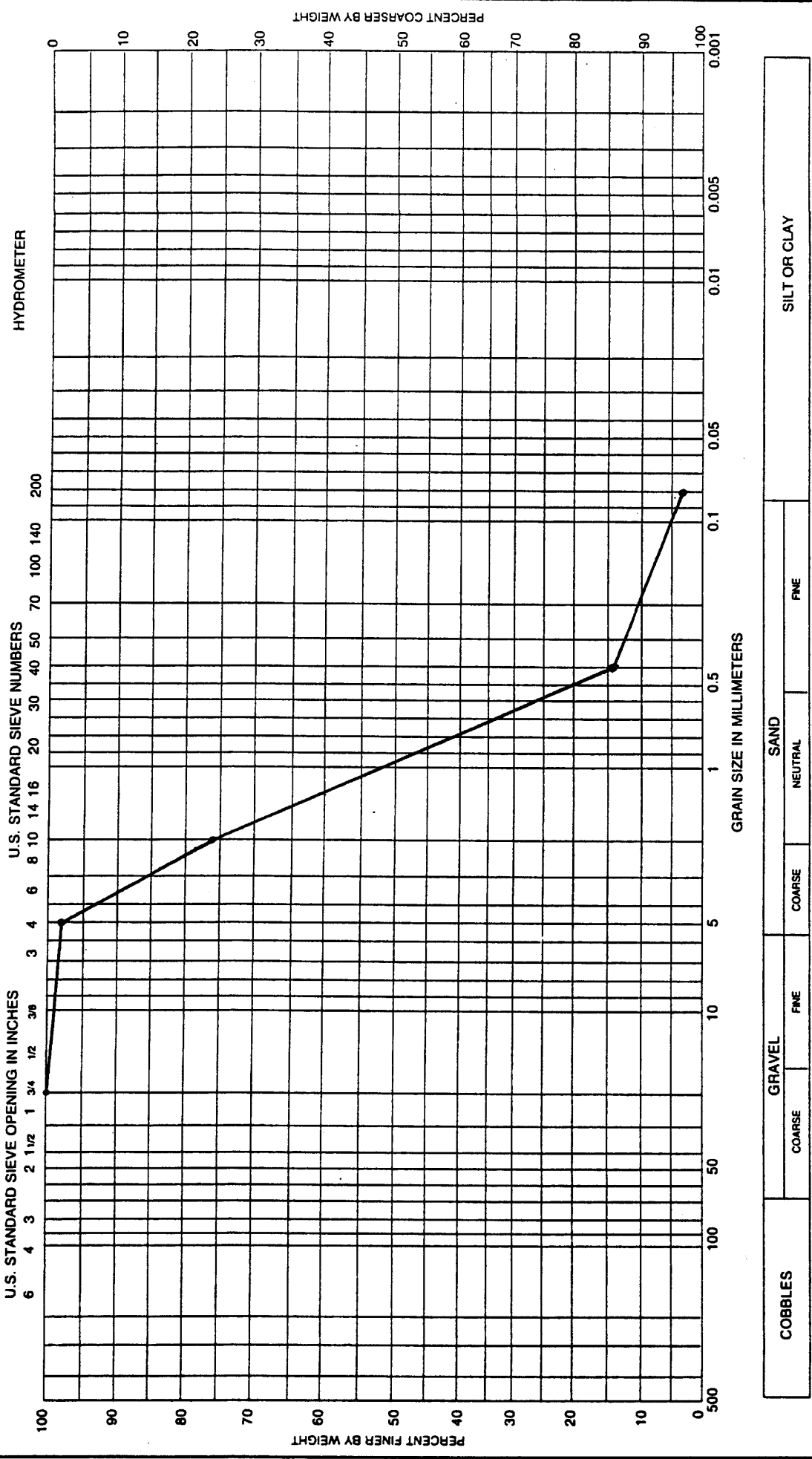


Sample No.	Elev or Depth	Classification	GRAVEL			SAND			SILT OR CLAY				
			COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI			
MW-5 -13	85'	Clayey Sand: Reddish Tan to Tan with Coarse Gravel(SC)				Net w %							

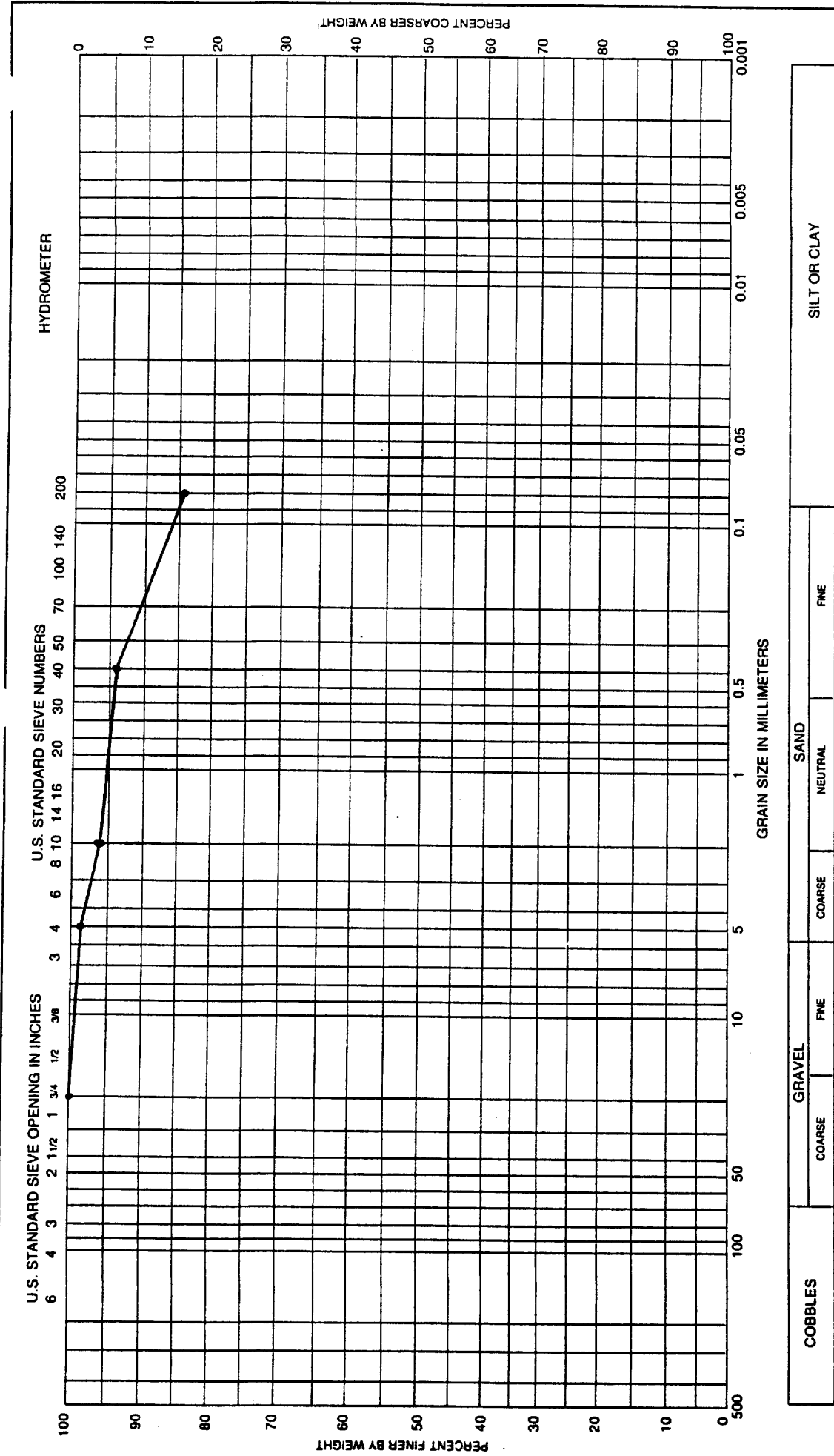
GRADATION CURVES

Project Amarillo MSWLF  
 Area  
 Boring No. MW-5  
 Date 8-19-94





COBBLES		GRAVEL		SAND		SILT OR CLAY	
COARSE		FINE		NEUTRAL		FINE	
Sample No.	Elev or Depth	Classification		Net w %	LL	PL	PI
MW-5 -14	90'	Clayey Sand: Reddish Tan to Tan with Coarse Gravel (SC)					
Project Amarillo MSLF							
Area							
Boring No. MW-5							
Date 8-19-94							
GRADATION CURVES							



Sample No. <b>MW-5 -15</b>	Elev or Depth <b>110'</b>	Classification <b>Clayey Sand: Reddish Tan to Tan with Coarse Gravel (SC)</b>	Net w %	LL	PL	PI
						<b>NP</b>
Project		Amarillo MSWLF				
Area						
Boring No.		MW-5				
Date		8-19-94				

**GRADATION CURVES**

**LOG OF BORING**

**MW - 6**

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo  
 Date: 7-8-94 thru 7-12-94  
 8-17-94 thru 8-19-94

BORING NO.: MW-6  
 LOCATION: Amarillo, Texas

Ground Elevation: 3746.38'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 155' Mud Drilled to 180'								
			DESCRIPTION OF STRATUM								
0			Caliche: Limestone Cap, Extremely Hard, Outcropping Existing at Surface (CL)								
5		X									
10		X	Clayey Sand: Light Tan Large Caliche Nodules (SC)	50-4"	9.7		35	28	7		23.3
15		X		20-6"	6.6		25	22	3		33.8
				50-12"							
20		X		50-6"	6.2		28	25	3		23.1
25		X	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Stiff, Dry (SC)	50-5.5"	7.2		28	22	6		30.5
30			Continued on Page 2								

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo  
 Date: 7-8-94 thru 7-12-94  
 8-17-94 thru 8-19-94

BORING NO.: MW-6  
 LOCATION: Amarillo, Texas  
 Ground Elevation: 3746.38'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 155' Mud Drilled to 180'									
			DESCRIPTION OF STRATUM									
30	○	X										
35	○	X										
40	○	X	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Stiff, Dry (SC)									
45	○	X										
50	○	X										
55	○	X										
60	○	X										

Continued on Page 3

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo  
 Date: 7-8-94 thru 7-12-94  
 8-17-94 thru 8-19-94

BORING NO.: MW-6  
 LOCATION: Amarillo, Texas

Ground Elevation: 3746.38'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 155' Mud Drilled to 180'									
			DESCRIPTION OF STRATUM									
60	○	X										
65	○	X	33-6"	5.3						NP		18.2
			50-8"									
70	○	X	50-6"	4.6						NP	2.75	21.5
			Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Stiff, Dry (SC)									
75	○	X	50-6"	6.3						NP		22.6
80	○	X	37-6"	6.1						NP		21.5
			50-8"									
85	○	X	34-6"	5.8						NP		19.0
			50-7.5"									
90	○	X										

Continued on Page 4

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo  
 7-8-94 thru 7-12-94  
 Date: 8-17-94 thru 8-19-94

BORING NO.: MW-6  
 LOCATION: Amarillo, Texas

Ground Elevation: 3746.38'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 155' Mud Drilled to 180'									
			DESCRIPTION OF STRATUM									
90	(Symbol: Diagonal lines with dots)	(Sample: X)										
			50-9"									
95	(Symbol: Diagonal lines with dots)	(Sample: X)										
100	(Symbol: Diagonal lines with dots)	(Sample: X)	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Dry, Stiff (SC)									
			50-7"									
105	(Symbol: Diagonal lines with dots)	(Sample: X)										
			50-7.5"									
110	(Symbol: Diagonal lines with dots)	(Sample: X)										
			50-7.5"									
115	(Symbol: Diagonal lines with dots)	(Sample: X)	K = 7.73 X 10 <sup>-4</sup> cm/sec (R)									
			50-10"									
120	(Symbol: Diagonal lines with dots)	(Sample: X)										

Continued on Page 5

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo  
 Date: 7-8-94 thru 7-12-94  
 8-17-94 thru 8-19-94

BORING NO.: MW-6  
 LOCATION: Amarillo, Texas

Ground Elevation: 3746.38'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 155' Mud Drilled to 180'									
120	(Symbol: Diagonal lines, top-left to bottom-right)											
- 125	(Symbol: Diagonal lines, top-left to bottom-right)	X	Organic Carbon Content (*) *1141.73		33-6" 50-8"	4.4		26	21	5		10.8
- 130	(Symbol: Diagonal lines, top-left to bottom-right)											
- 135	(Symbol: Diagonal lines, top-left to bottom-right)	X			30-6" 50-8"	4.1		19	16	3		19.8
- 140	(Symbol: Diagonal lines, top-left to bottom-right)											
- 145	(Symbol: Diagonal lines, top-left to bottom-right)	X	Sand: Tan with Scattered Calcareous Nodules (SC) * 343.77		20-6" 50-11.5"	9.2				NP		14.0
- 150	(Symbol: Diagonal lines, top-left to bottom-right)		Continued on Page 6									



## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo  
 Date: 7-8-94 thru 7-12-94  
 8-17-94 thru 8-19-94

BORING NO.: MW-6  
 LOCATION: Amarillo, Texas

Ground Elevation: 3746.38'



DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 155' Mud Drilled to 180'									
			DESCRIPTION OF STRATUM									
150		X	Sand: Tan, Well Sorted with Scattered Calcareous Nodules with Pea Gravel (GW)									
-155												
-160		X	Sand: Reddish Tan with Scattered Calcareous Nodules (SC)									
-165												
-170												
-175												
-180		X	Clayey Sand: Reddish Brown (SC)									
-180												

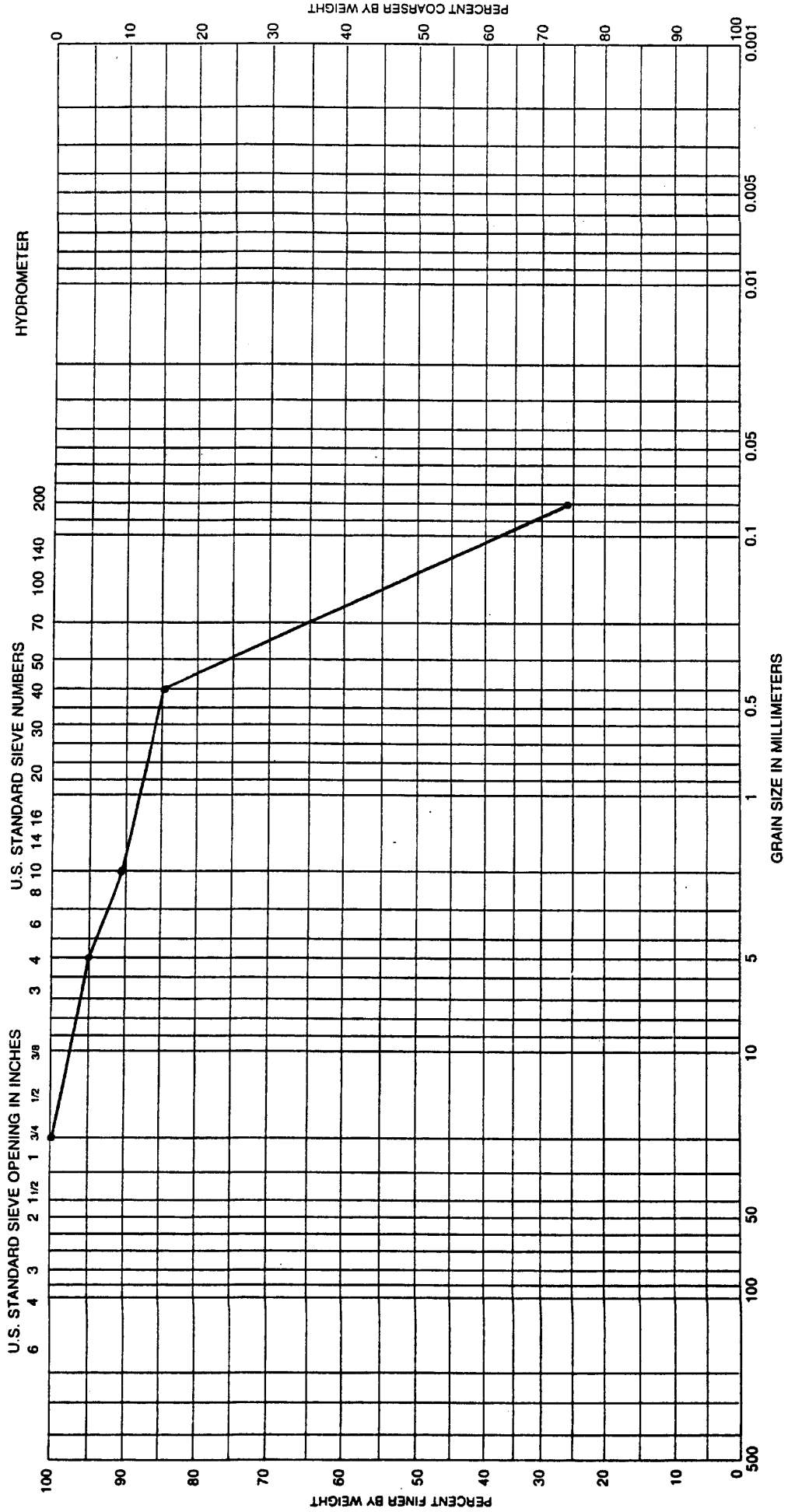
Continued on Page 7

**LOG OF BORING**

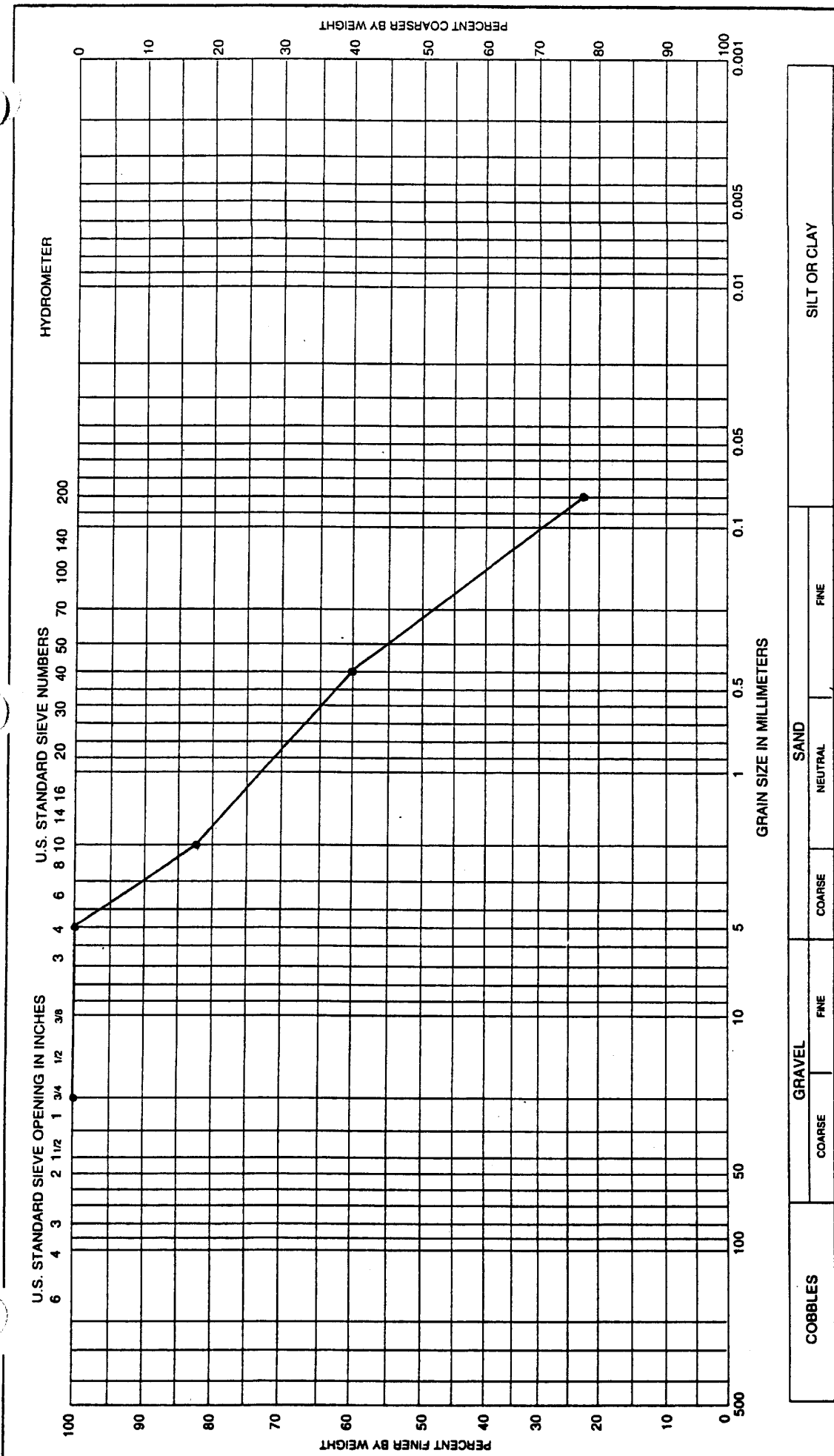
PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo  
 Date: 7-8-94 thru 7-12-94  
 8-17-94 thru 8-19-94

BORING NO.: MW-6  
 LOCATION: Amarillo, Texas  
 Ground Elevation: 3746.38'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 155' Mud Drilled to 180'								
			DESCRIPTION OF STRATUM								
180				50-5"							
			* T.D. - 180' *								

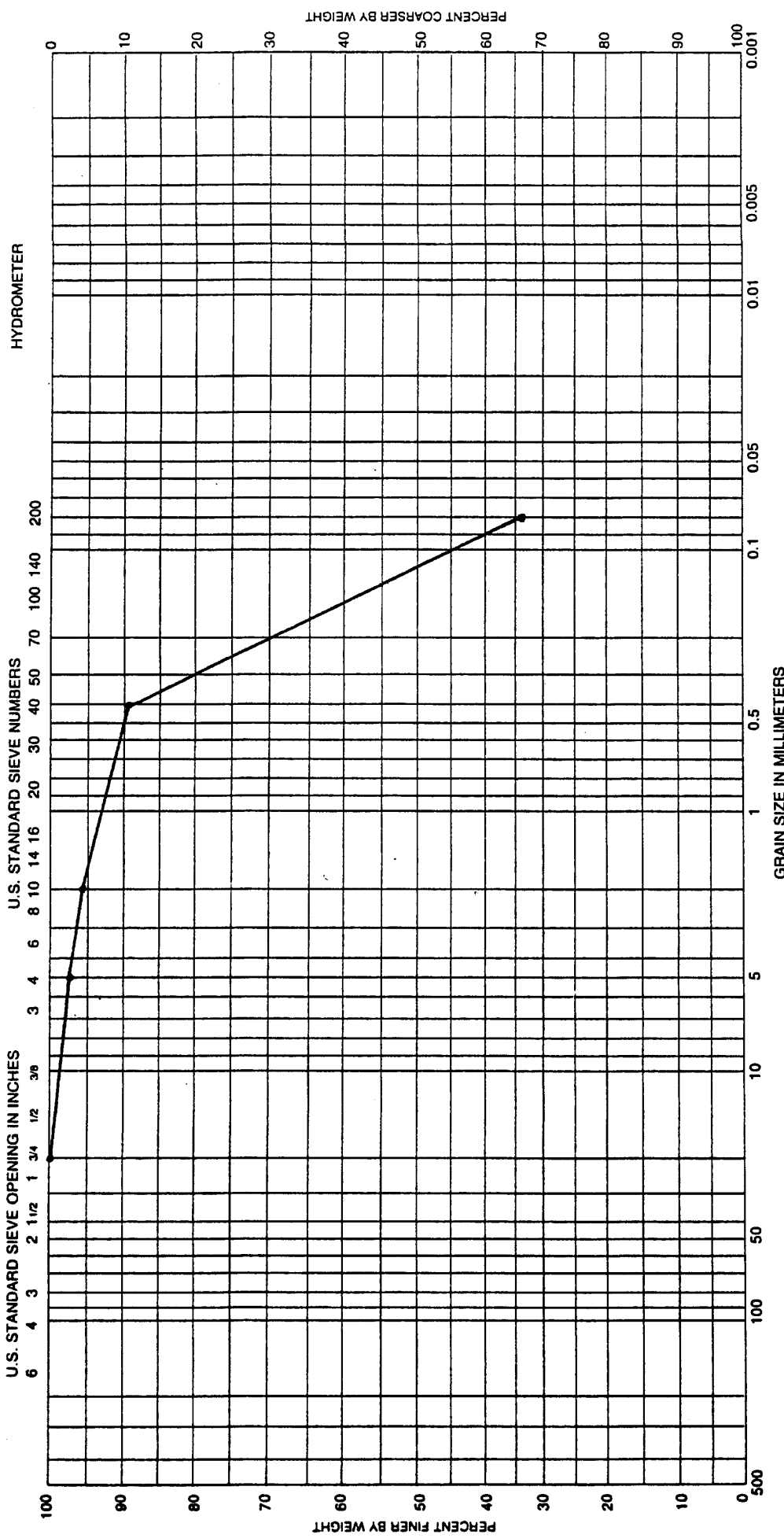


Sample No.	Elev or Depth	GRAVEL		SAND		FINE		SILT OR CLAY	
		COARSE	FINE	NEUTRAL	FINE	PL	PI		
MW-6 - 1	5'	Classification		Net w %	LL	PL	PI	Project	Amarillo MSW-LF
		Caliche: Limestone Cap						Area	
		Extremely Hard, Outcropping						Boring No.	MW-6
		Existing at Surface						Date	7-8-94
<b>GRADATION CURVES</b>									



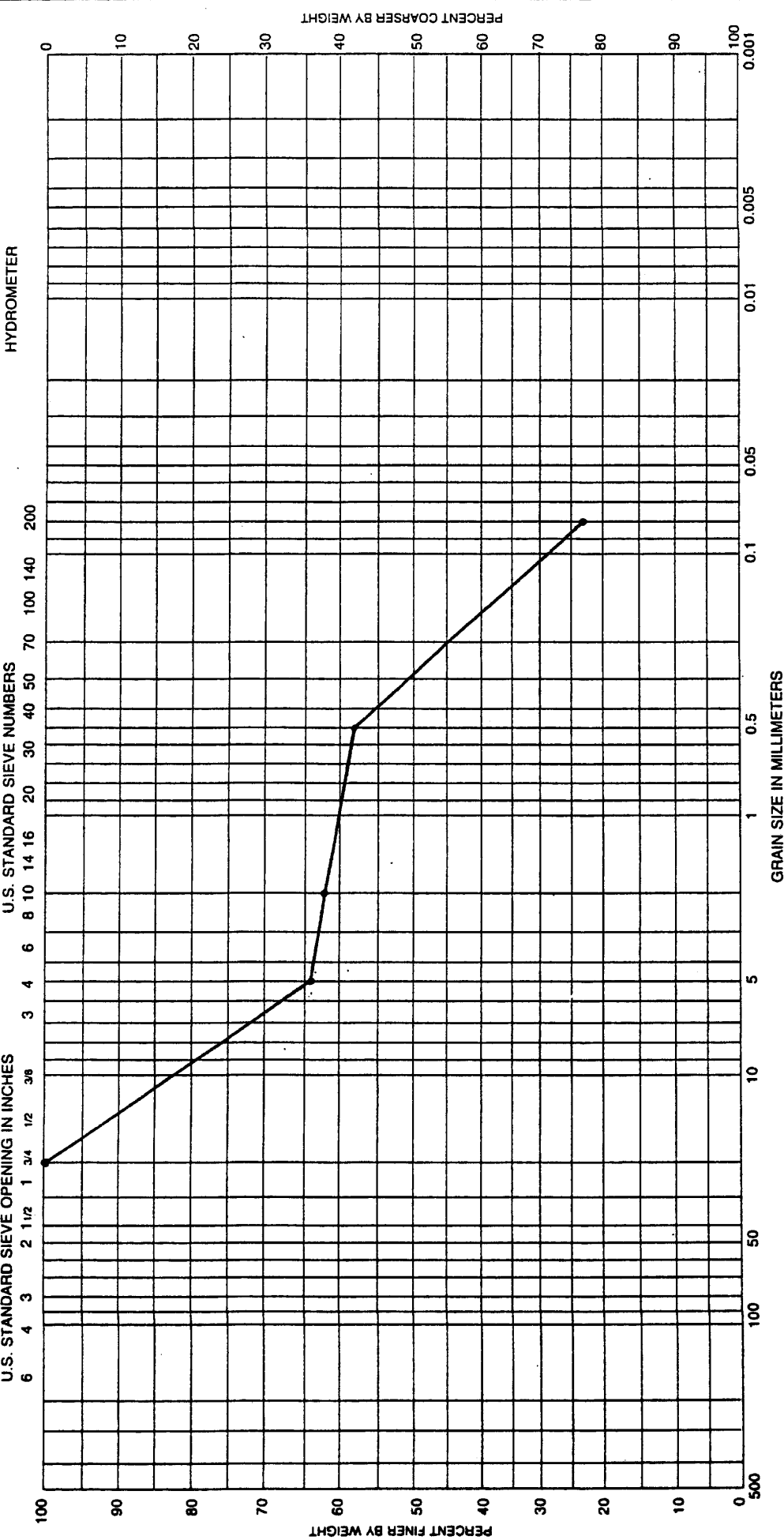
Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-6 - 2	10'	Clayey Sand: Light Tan Large Caliche Nodules (SC)		35	28	7

GRADATION CURVES

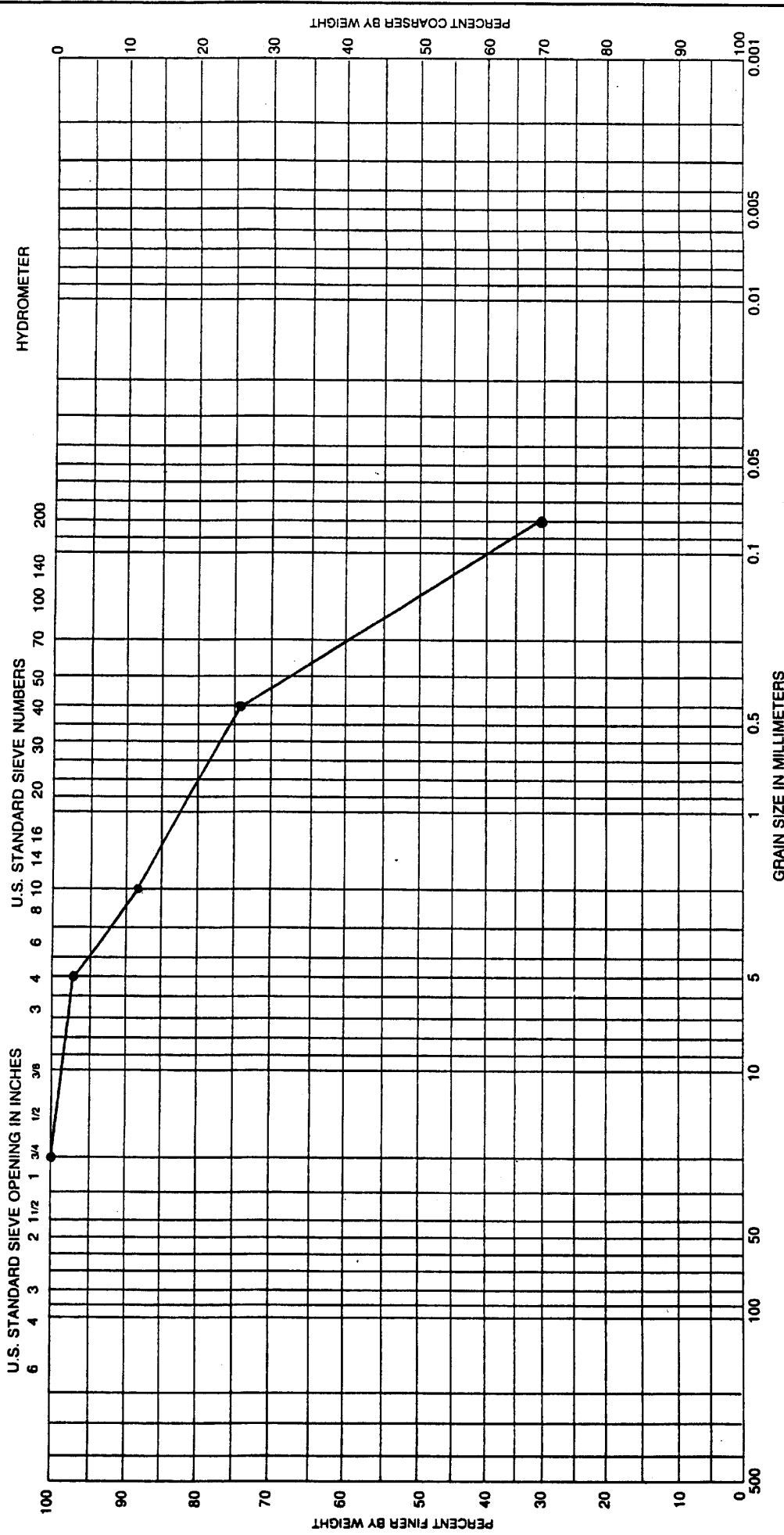


Sample No.	Elev or Depth	GRAVEL			SAND			SILT OR CLAY	Project	Amarillo MSW-LF
		COARSE	FINE	Classification	COARSE	NEUTRAL	FINE			
MW-6 - 3	15'			Clayey Sand: Light Tan Large Caliche Nodules (sg)						
					Net w %	LL	PL	PI		
						25	22	3		
									Area	
									Boring No.	MW-6
									Date	7-8-94

GRADATION CURVES

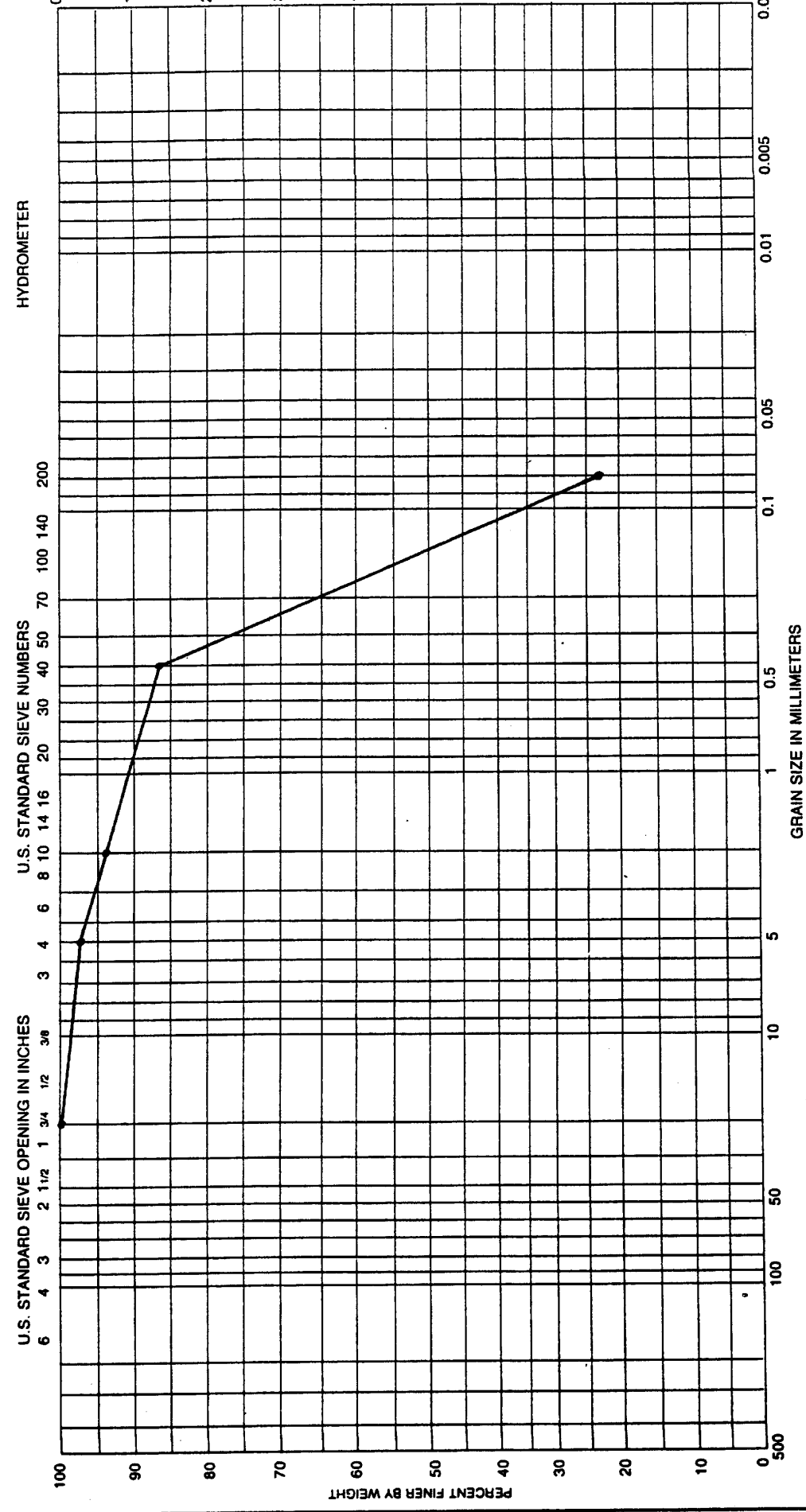


COBBLES	GRAVEL		SAND		SILT OR CLAY			
	COARSE	FINE	NEUTRAL	FINE				
Sample No.	Elev or Depth	Classification			Net w %	LL	PL	PI
MW-6 - 4	20'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Stiff, Dry (SC)				28	25	3
					Area	MW-6		
					Boring No.	MW-6		
					Date	7-8-94		
					Project	Amarillo MSW-LF		
<b>GRADATION CURVES</b>								



GRAVEL		SAND		SILT OR CLAY	
COARSE	FINE	COARSE	NEUTRAL	FINE	SILT OR CLAY
<b>Sample No.</b> MW-6-5		<b>Elev or Depth</b> 25'		<b>Project</b> Amarillo MSLWF	
<b>Classification</b> Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)					
		<b>Net w %</b> 		<b>LL</b> 28	
		<b>PL</b> 22		<b>PI</b> 6	
<b>Area</b> 					
<b>Boring No.</b> MW-6					
<b>Date</b> 7-8-94					

**GRADATION CURVES**

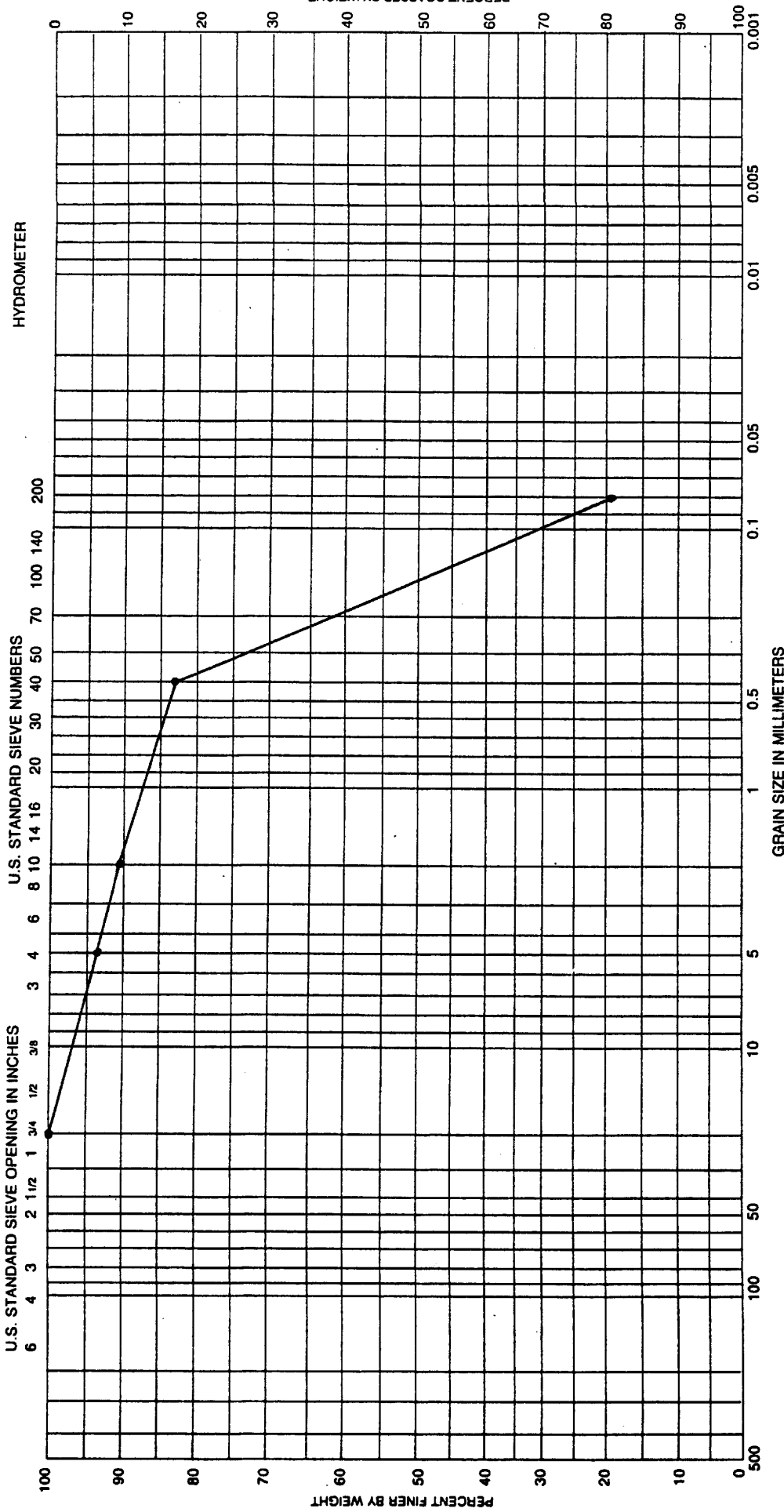


COBBLES GRAVEL SAND SILT OR CLAY  
 COARSE FINE COARSE FINE FINE FINE

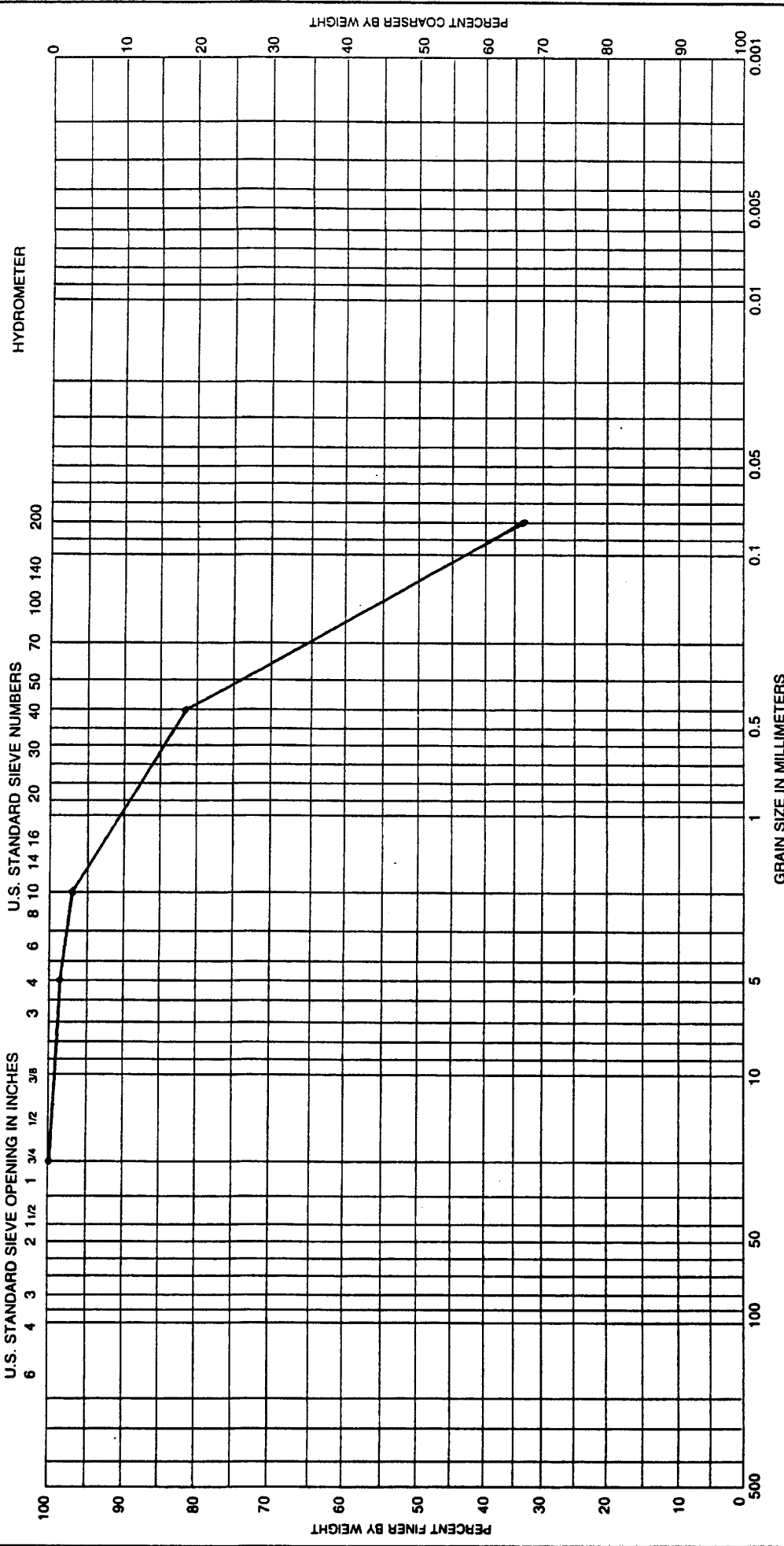
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
MM-6 - 6	30'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)				NP	
							Area
							Boring No.
							MW-6
							Date
							7-8-94

GRADATION CURVES





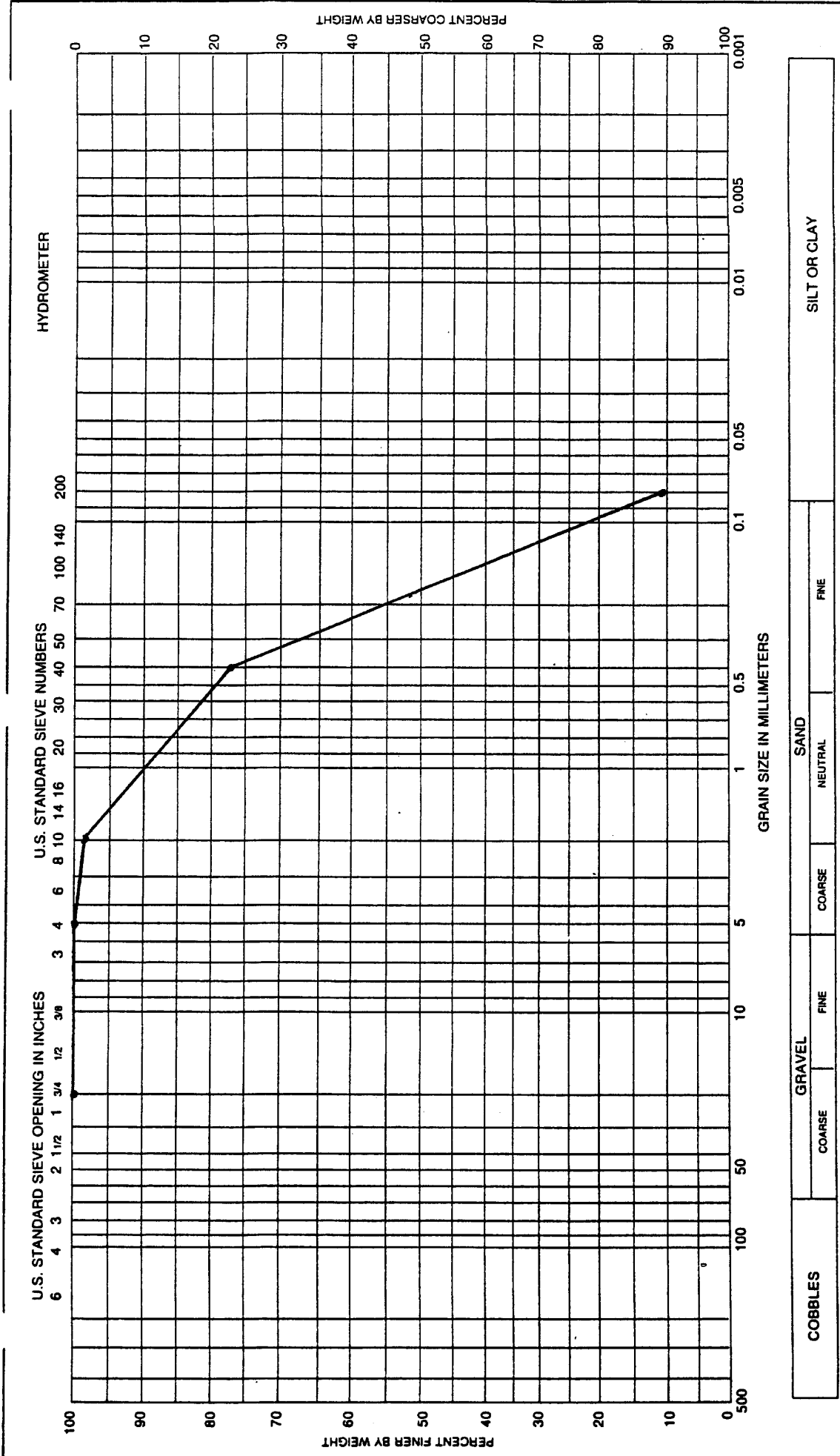
COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	NEUTRAL	FINE		
Sample No.	Elev or Depth	Classification				PI	Project
MW-6-7	35'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)				23	Amarillo MSWLF
						PL	
						20	
						LL	
							Area
							Boring No.
							MW-6
							Date
							7-8-94
<b>GRADATION CURVES</b>							



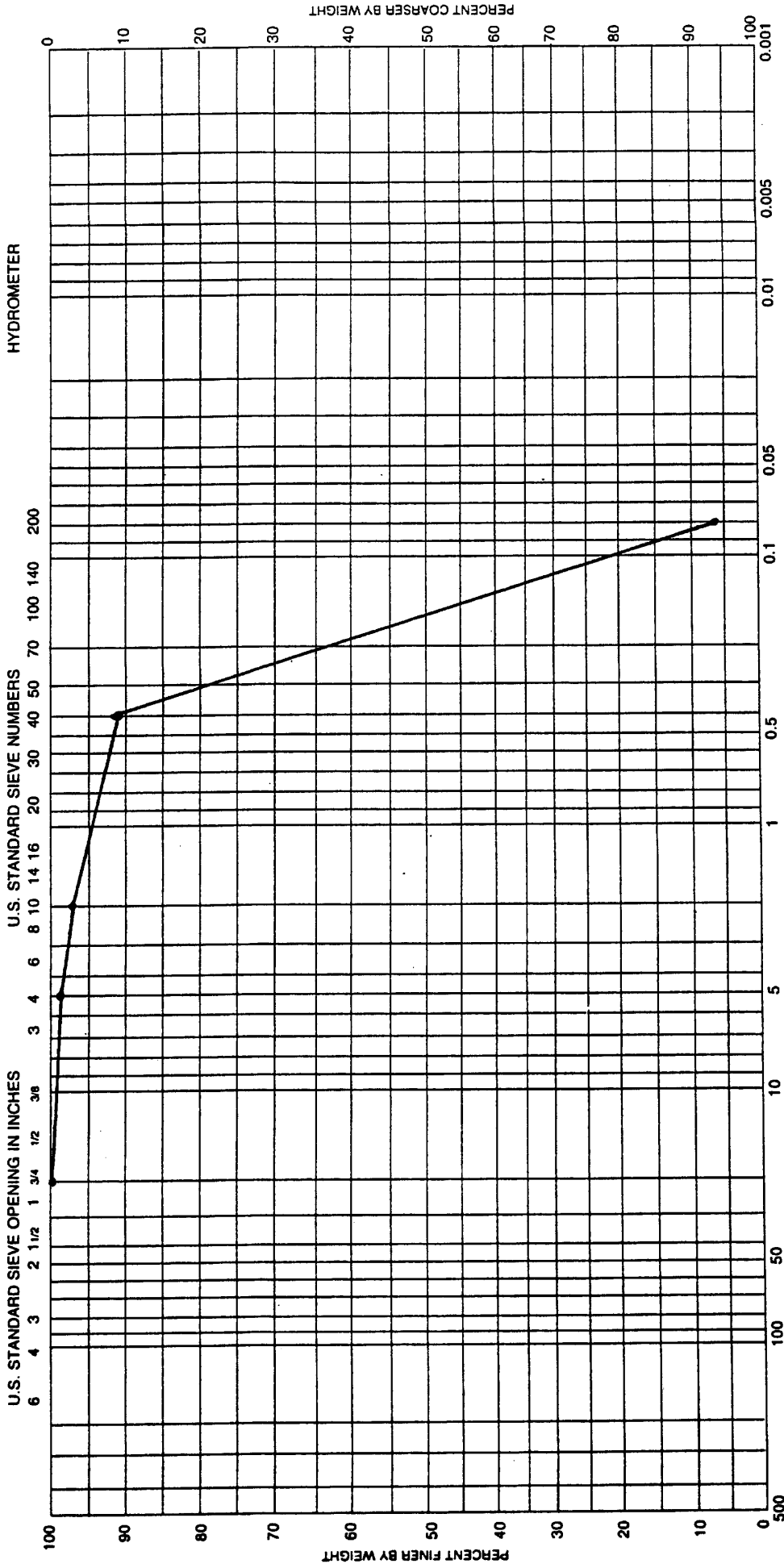
Sample No.	Elev or Depth	Classification	SAND			LL	PL	PI
			Net w %	NEUTRAL	FINE			
MW-6 - 8	40'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)	21		18	3		

GRADATION CURVES

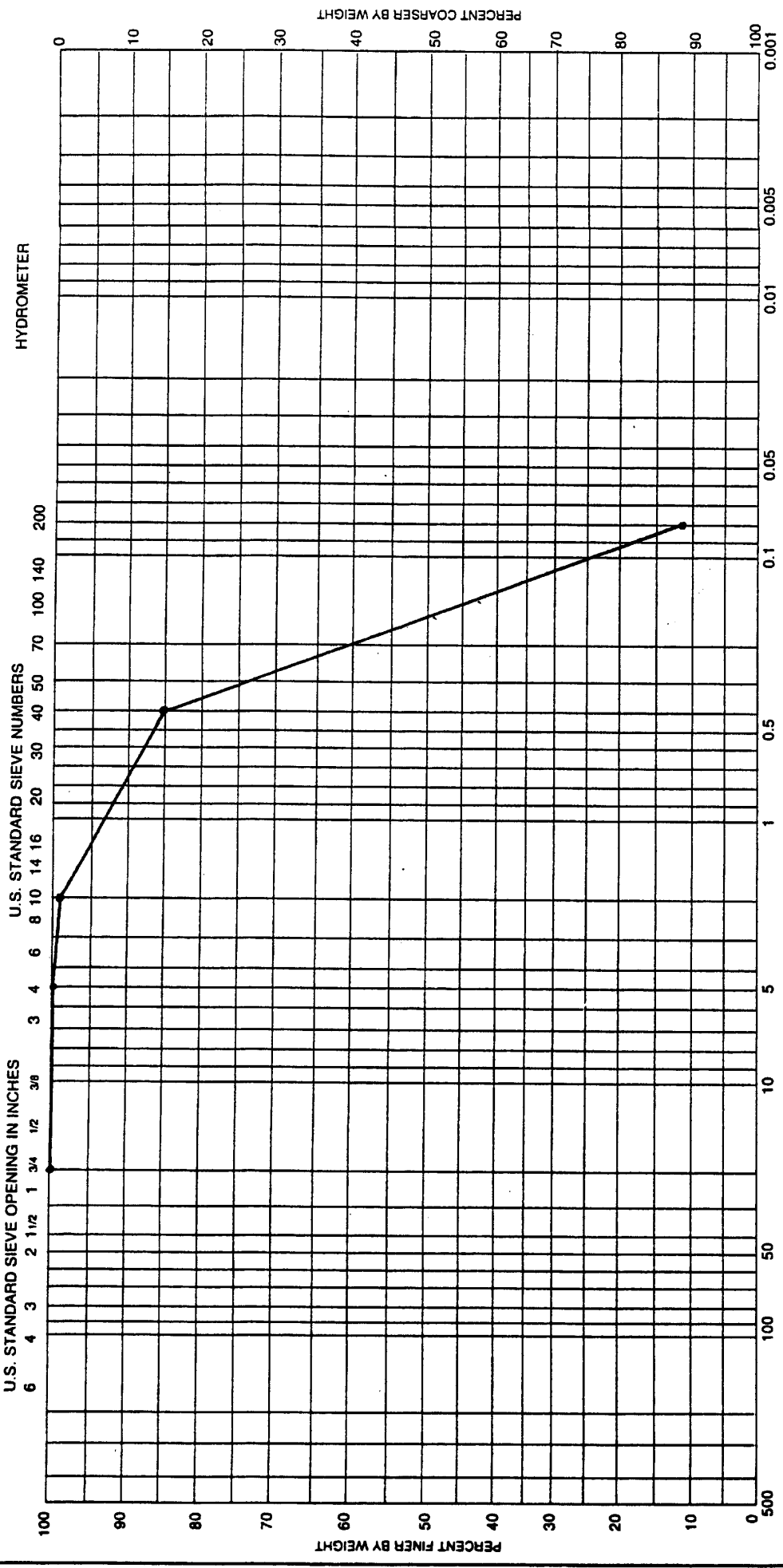
Project **Amarillo MSW-LF**  
 Area  
 Boring No. **MW-6**  
 Date **7-8-94**



Project		Amarillo MSW-LF			
Area					
Boring No.		MW-6			
Date		7-8-94			



COBBLES		GRAVEL		SAND			SILT OR CLAY			
COARSE		FINE		NEUTRAL			FINE			
Sample No.	Elev or Depth	Classification					PI	PL	LL	Net w %
MW-6 - 10	50'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)					NP			
Project										
Amarillo MSW-LF										
Area										
Boring No.										
MW-6										
Date										
7-8-94										
<b>GRADATION CURVES</b>										

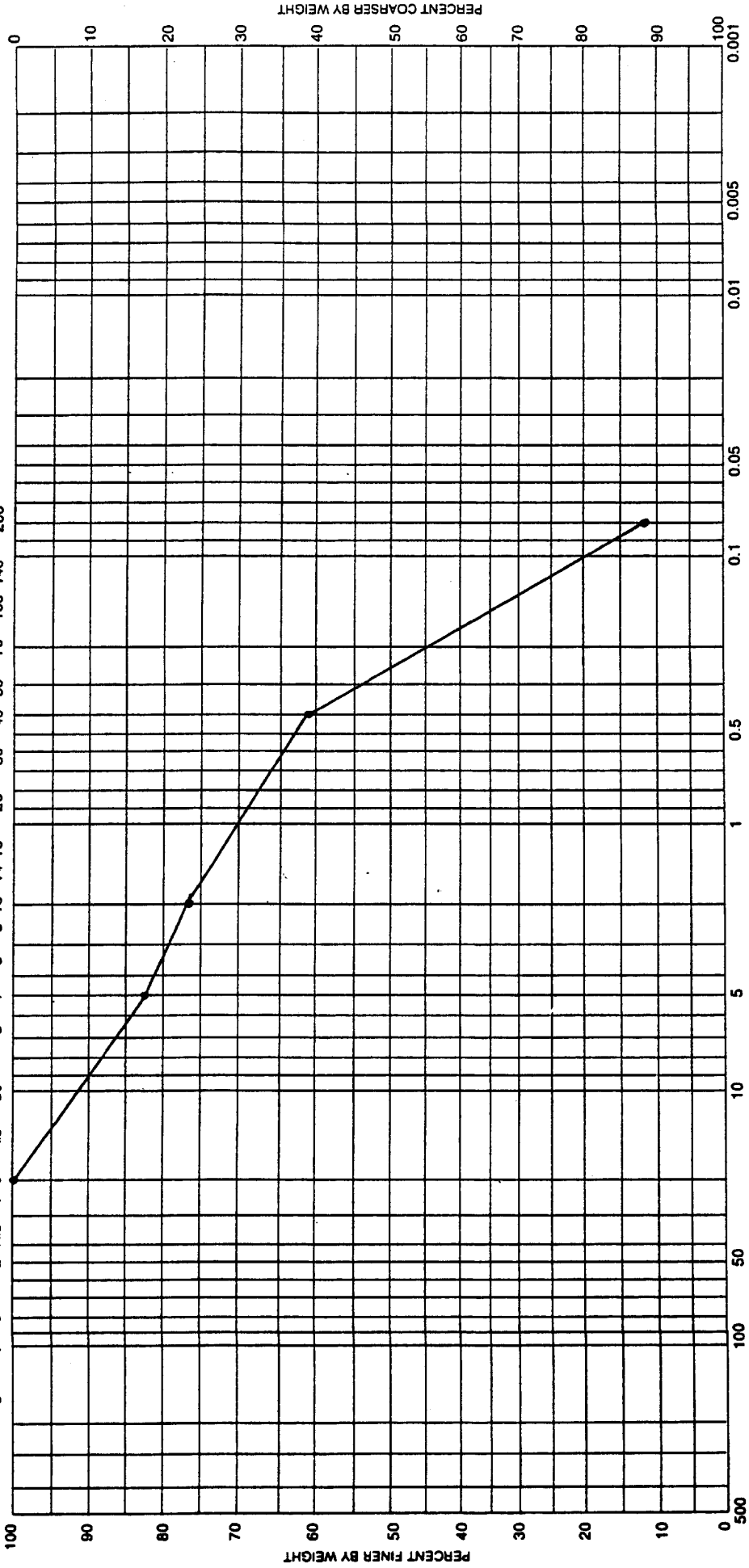


Sample No.	Elev or Depth	Classification	SAND			GRAVEL		HYDROMETER		Project	Area	Boring No.	Date
			Net w %	LL	PL	PI	COARSE	FINE	COARSE				
MW-6 - 11	55'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)								Amarillo	MSW-LF		
GRADATION CURVES													

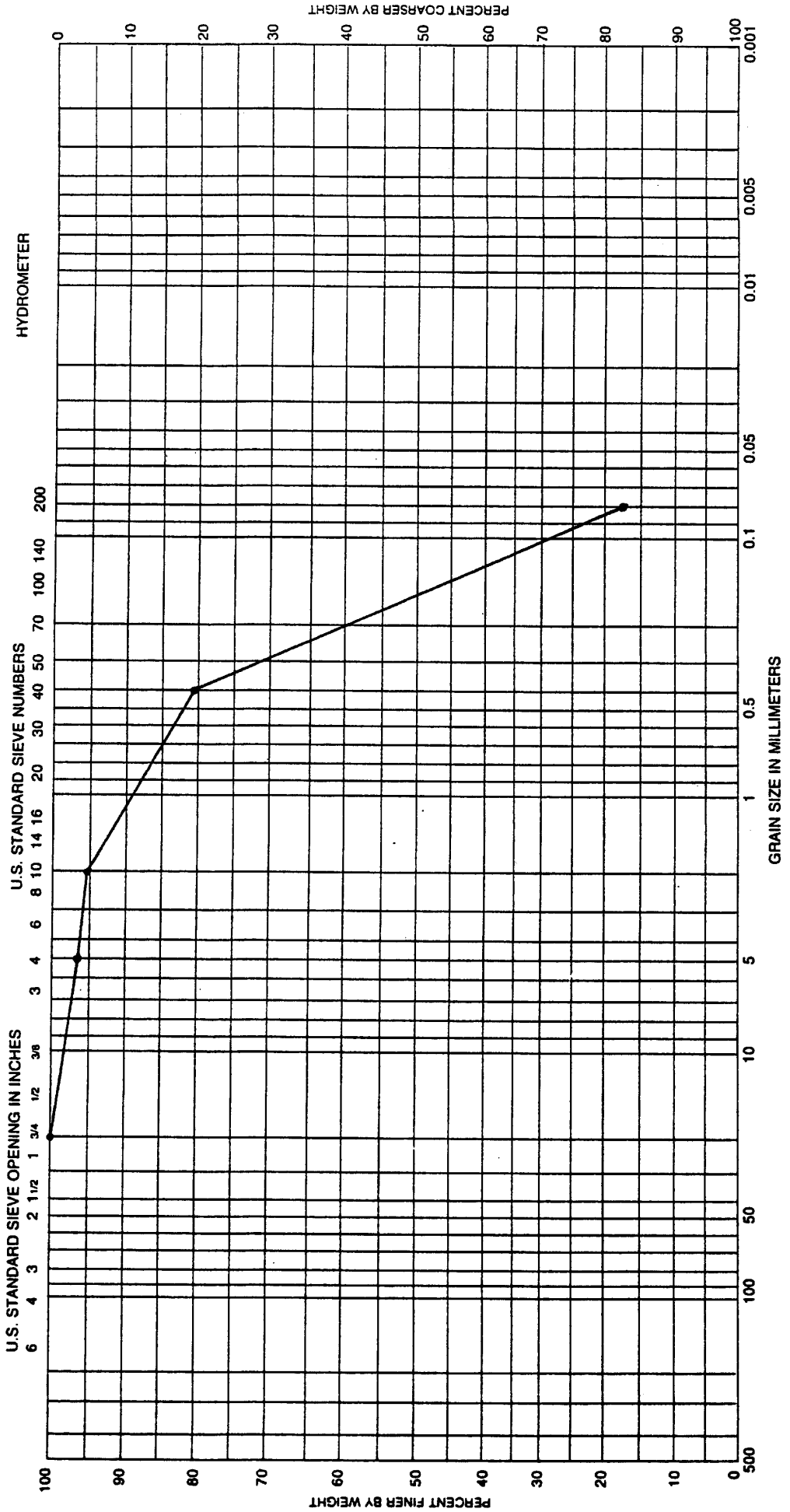
HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



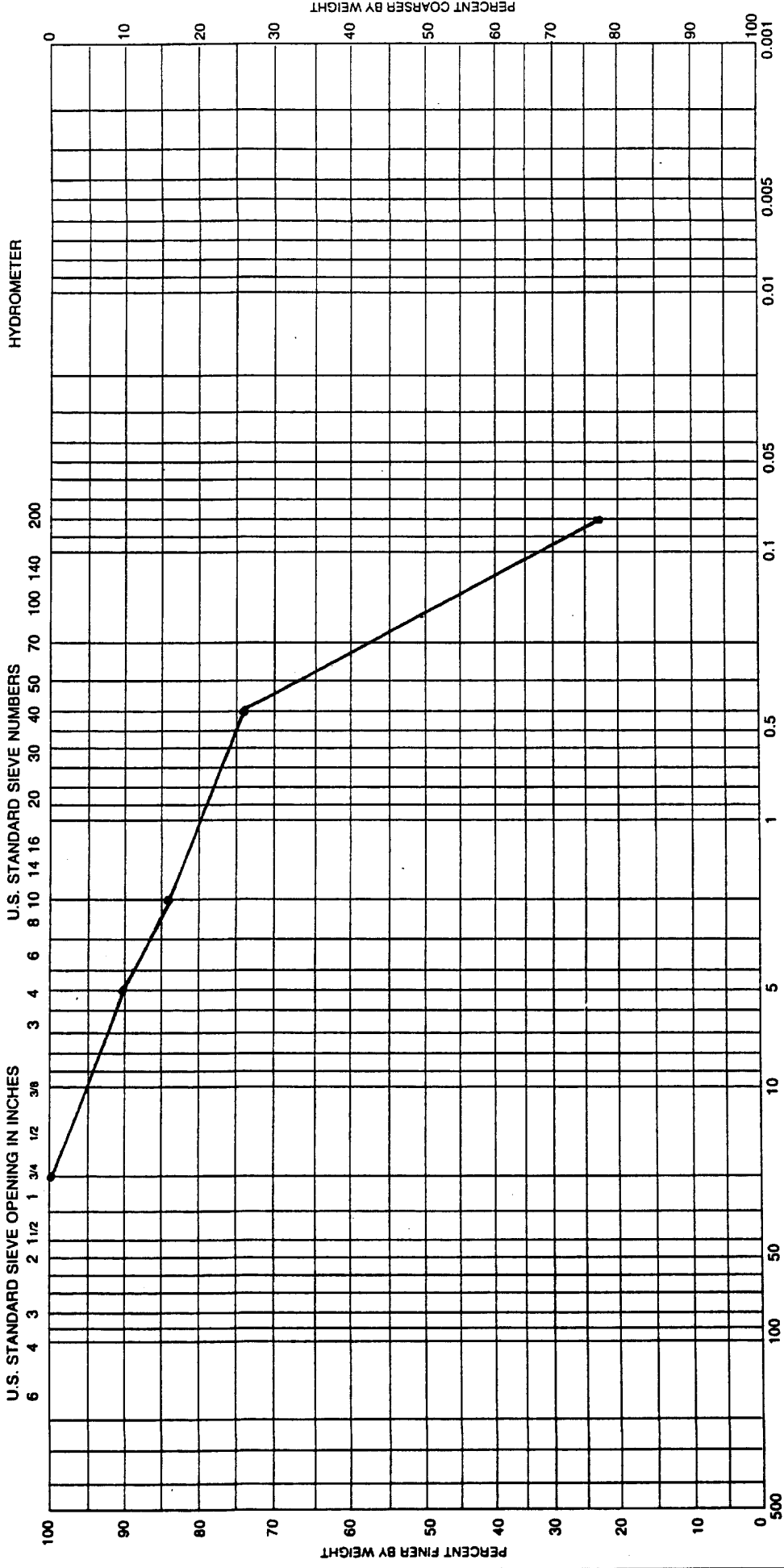
		GRAVEL			SAND			SILT OR CLAY			
		COARSE	FINE		NEUTRAL	FINE					
Sample No.	Elev or Depth	Classification						Net w %	LL	PL	PI
MW-6-12	60'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)							19	16	3
		Project						Amarillo MSWLF			
		Area									
		Boring No.						MW-6			
		Date						7-8-94			
<b>GRADATION CURVES</b>											



COBBLES	GRAVEL		SAND			SILT OR CLAY		
	COARSE	FINE	NEUTRAL	FINE				

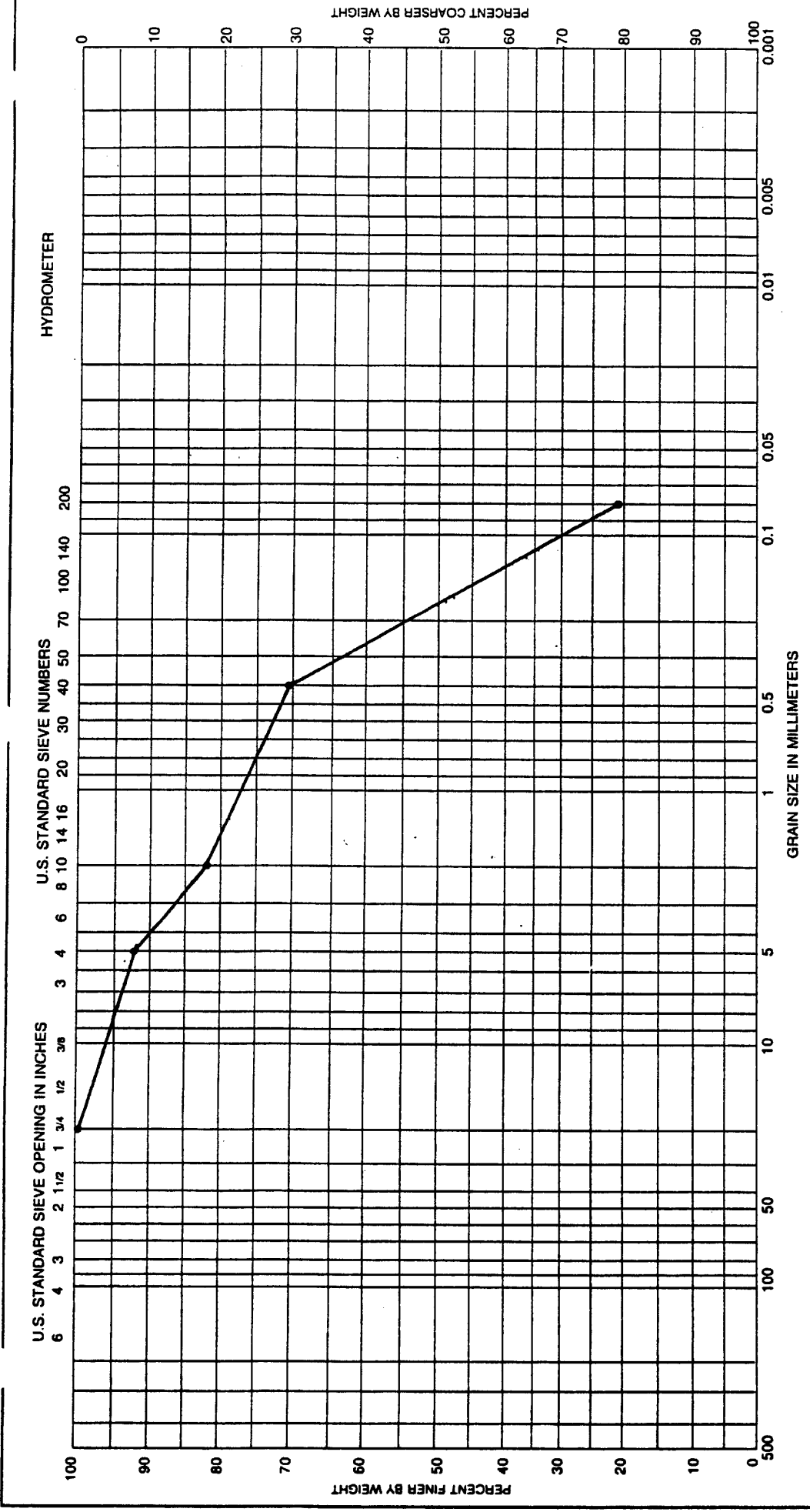
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
MM-6-13	65'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)				NP	Amarillo MSWLF
							Area
							Boring No. MW-6
							Date 7-8-94

GRADATION CURVES



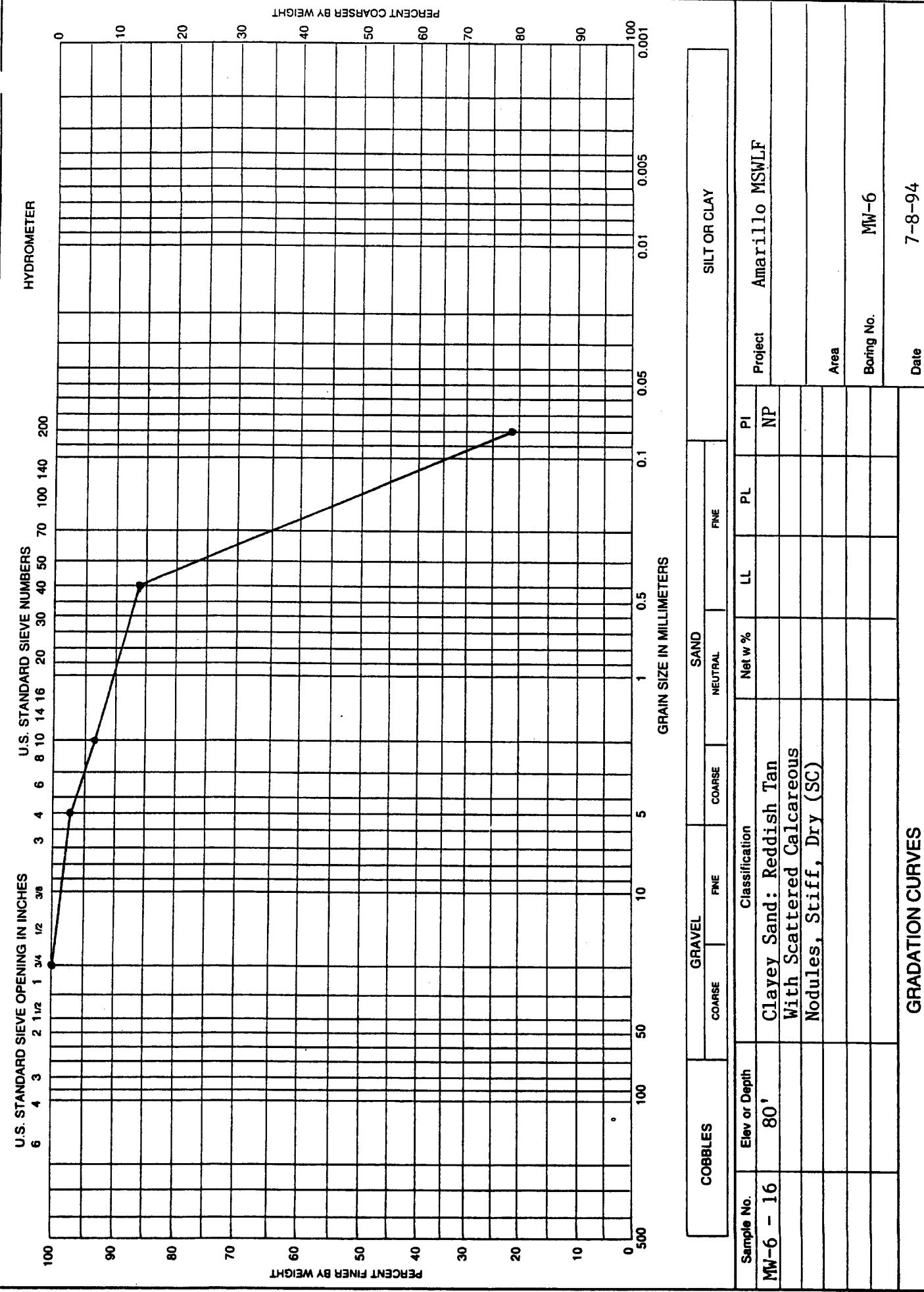
COBBLES		GRAVEL		SAND		SILT OR CLAY			
		COARSE	FINE	COARSE	FINE	NEUTRAL	FINE		
Sample No.	Elev or Depth	Classification				Net w %	LL	PL	PI
MW-6 - 14	70'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)							NP
						Area			
						Boring No.	MW-6		
						Project	Amarillo MSW-LF		
<b>GRADATION CURVES</b>		Date				7-8-94			





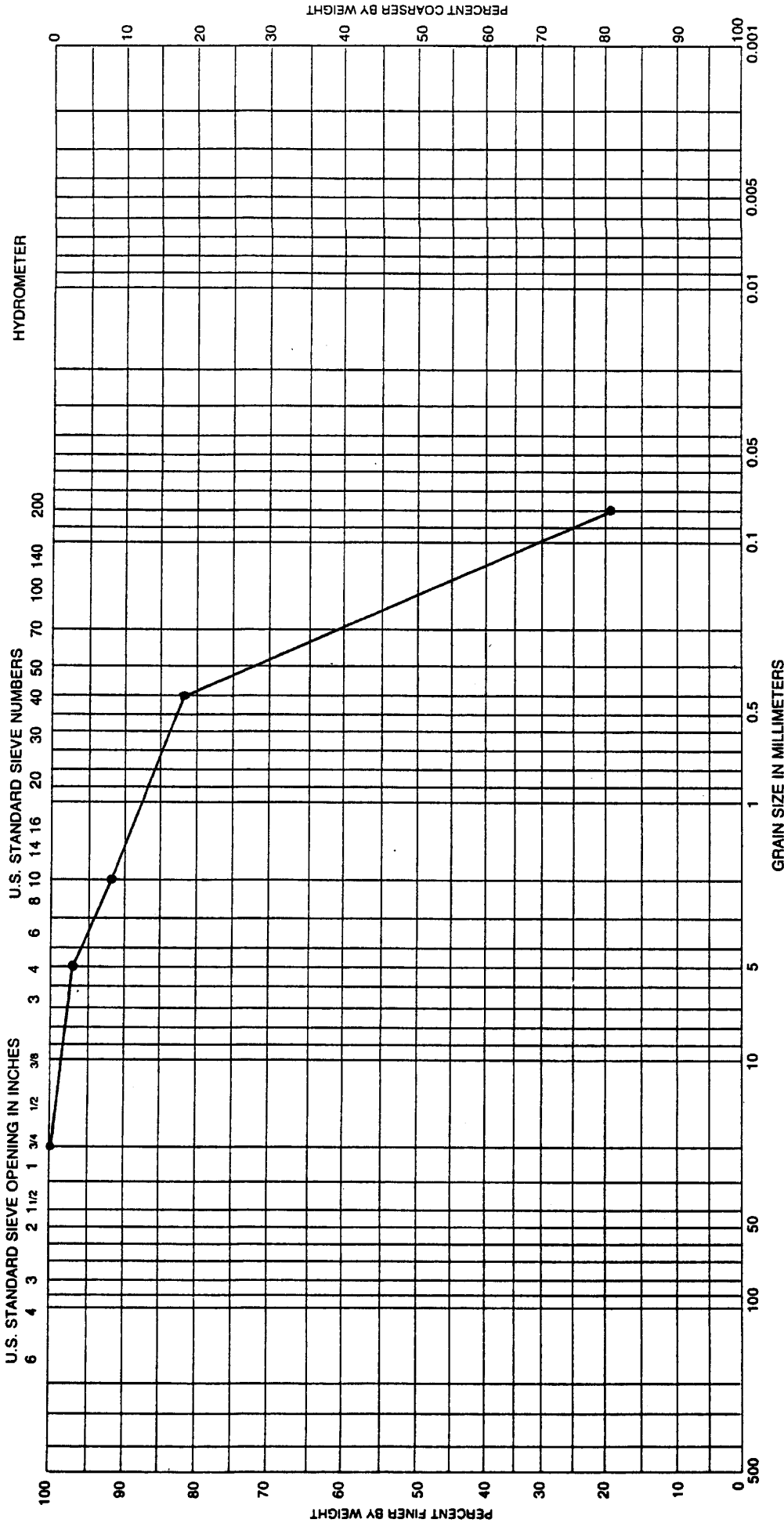
COBBLES		GRAVEL		SAND			SILT OR CLAY	
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project	Area
MW-6 - 15	75'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)				NP	Amarillo	MSW-LF
							Boring No.	MW-6
							Date	7-8-94

**GRADATION CURVES**



COBBLES		GRAVEL			SAND			SILT OR CLAY		
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project	Area	Boring No.	Date
MW-6 - 16	80'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)				NP	Amarillo MSWLF		MW-6	7-8-94

**GRADATION CURVES**



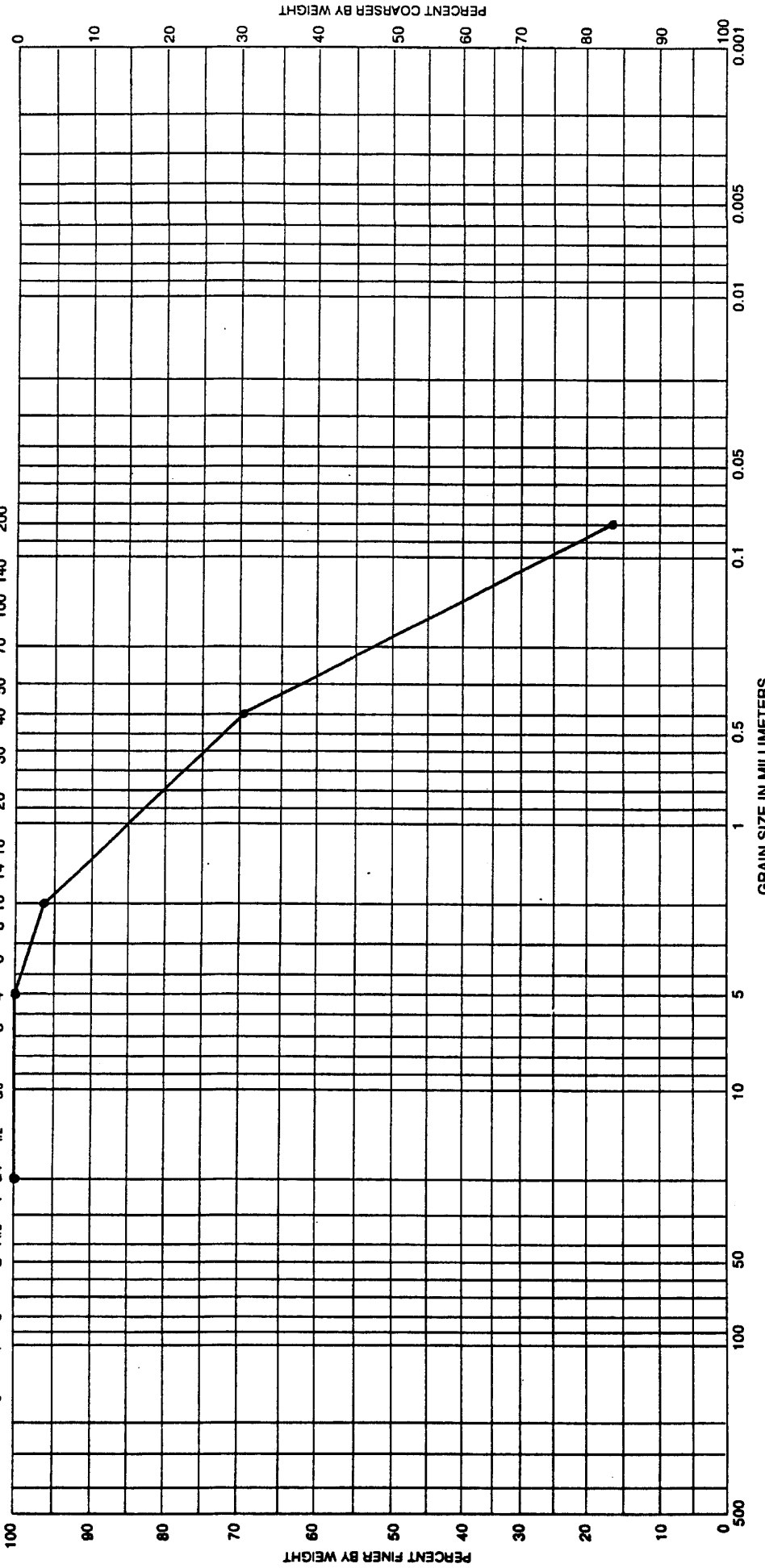
COBBLES	GRAVEL		SAND		SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project	Amarillo MSW-LF
MW-6 - 17	85'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)				NP		
							Area	
							Boring No.	MW-6
							Date	7-8-94
GRADATION CURVES								

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-6 - 18	90'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)				NP

COBBLES		GRAVEL		SAND		SILT OR CLAY	
COARSE	FINE	COARSE	FINE	NEUTRAL	FINE		

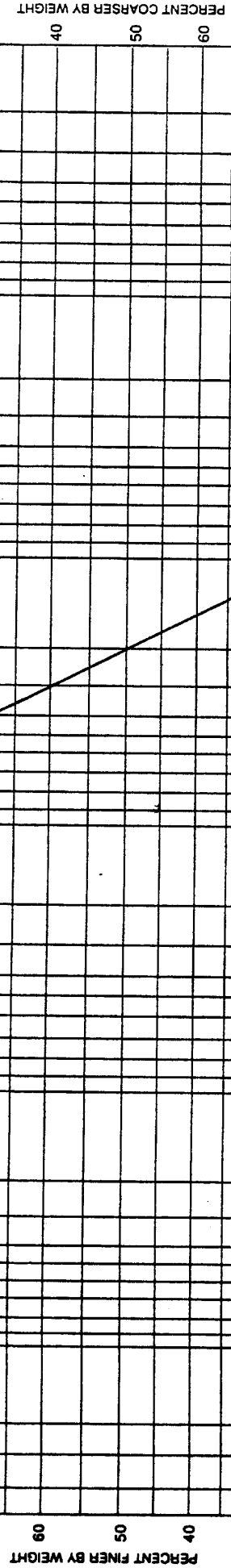
Project	Amarillo MSW-LF
Area	
Boring No.	MW-6
Date	7-8-94

GRADATION CURVES

U.S. STANDARD SIEVE OPENING IN INCHES  
 6 4 3 2 1 1/2 1 3/4 1/2 3/8

U.S. STANDARD SIEVE NUMBERS  
 10 20 30 40 50 60 70 100 140 200

HYDROMETER



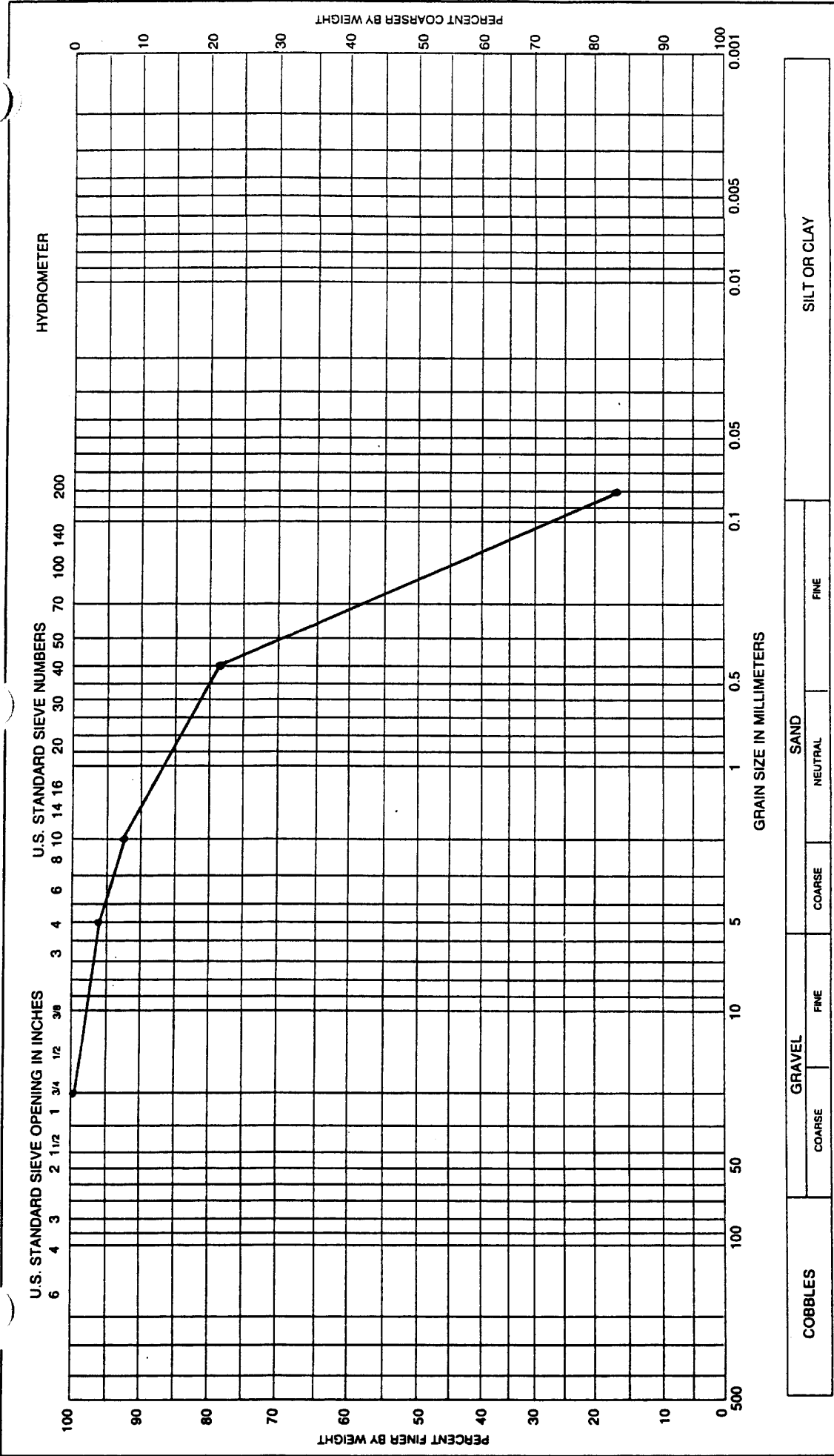
Sample No.	Elev or Depth	GRAVEL		SAND		SILT OR CLAY		
		COARSE	FINE	NEUTRAL	FINE	PL	PI	LI
MW-6-19	95'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)						

Project	Amarillo MSWLF
Area	
Boring No.	MW-6
Date	7-8-94

**GRADATION CURVES**



Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
MW-6 - 20	100'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)		23	20	3

COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	NEUTRAL	FINE		

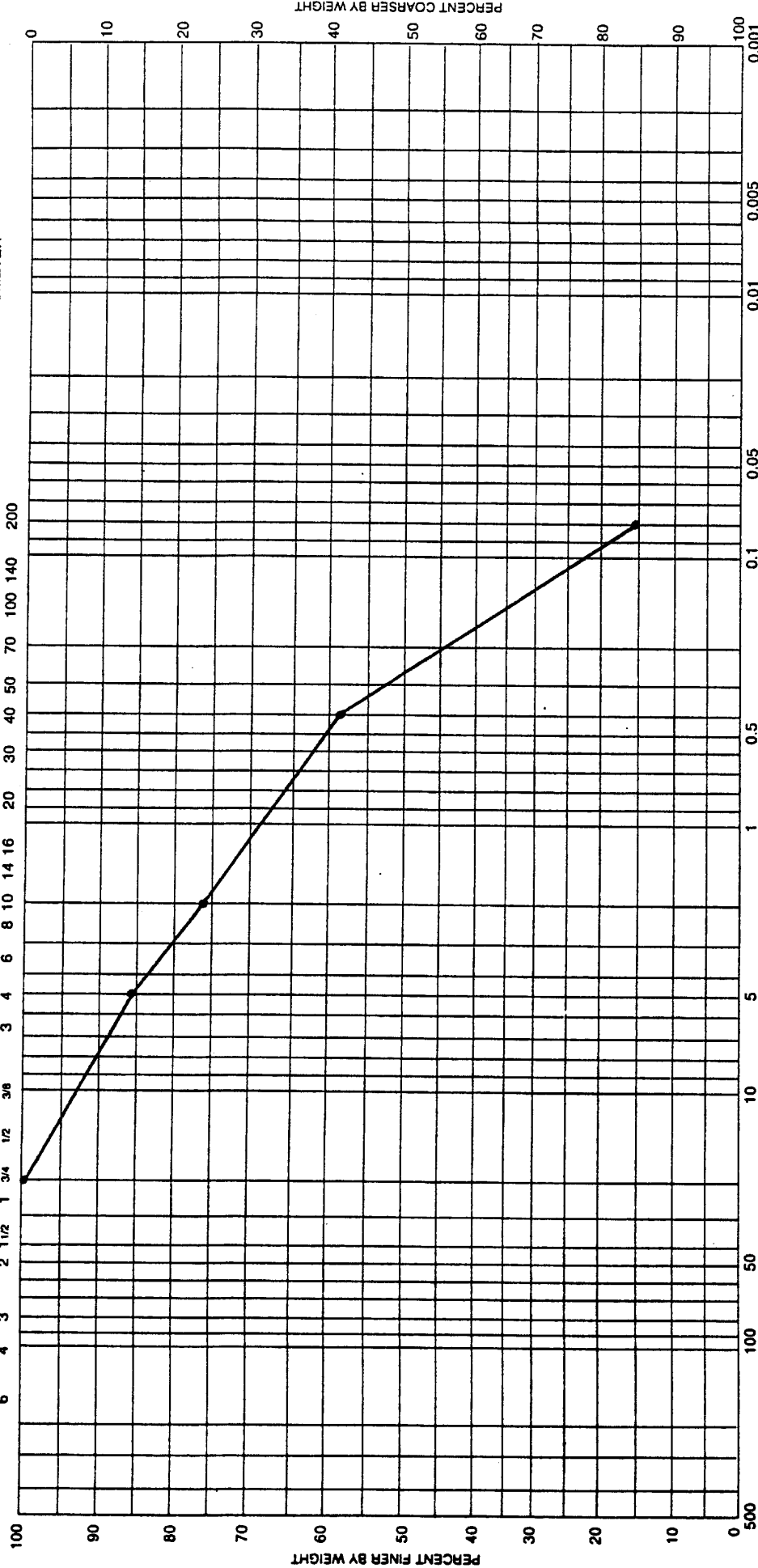
Project	Amarillo MSW-LF
Area	
Boring No.	MW-6
Date	7-8-94

GRADATION CURVES

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



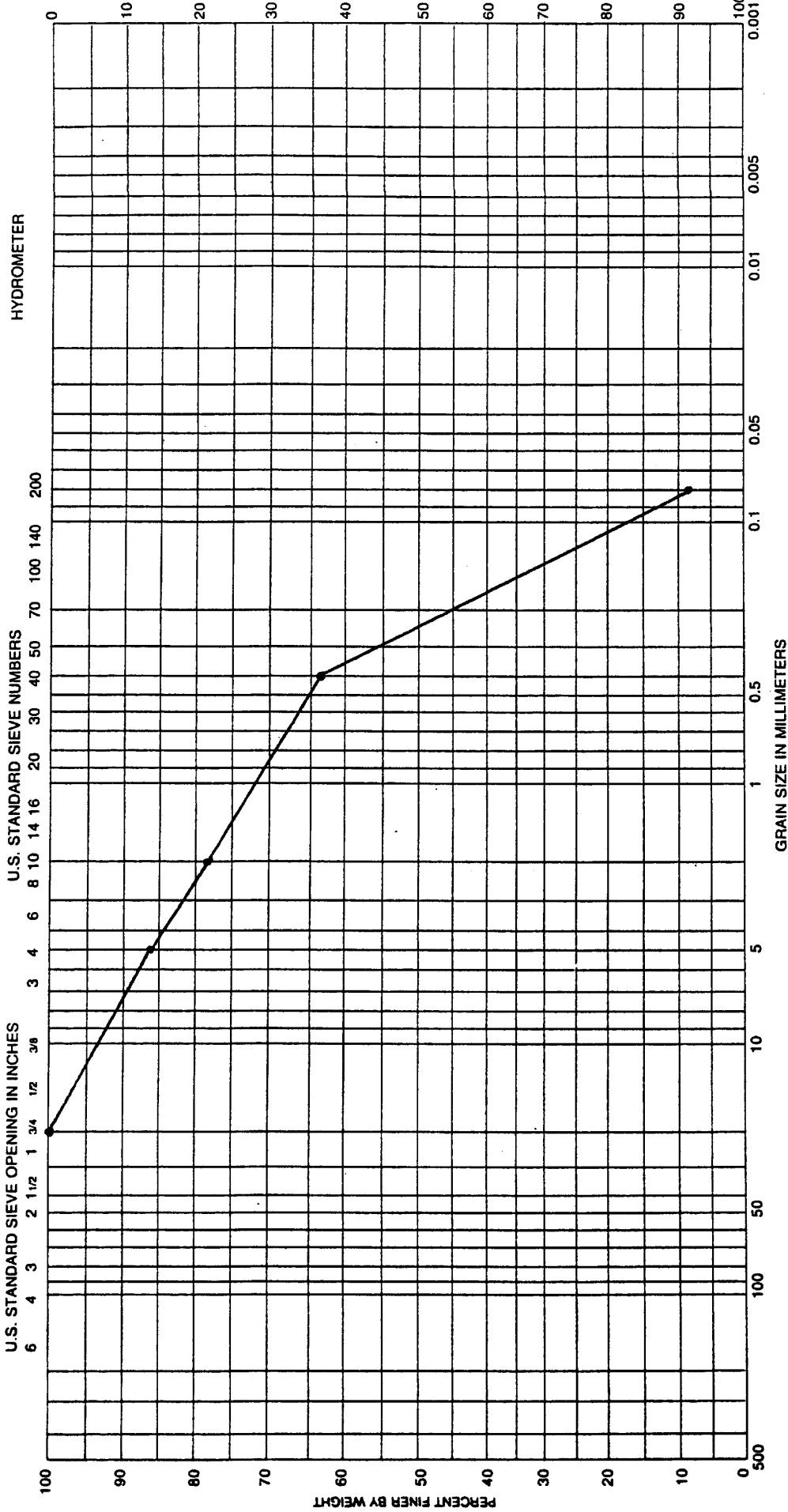
COBBLES	GRAVEL			SAND			SILT OR CLAY	
	COARSE	FINE		NEUTRAL	FINE			

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
MW-6 - 21	105'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)		24	20	4
		Project	Amarillo MSW-LF			
		Area				
		Boring No.	MW-6			
		Date	7-8-94			
<b>GRADATION CURVES</b>						

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

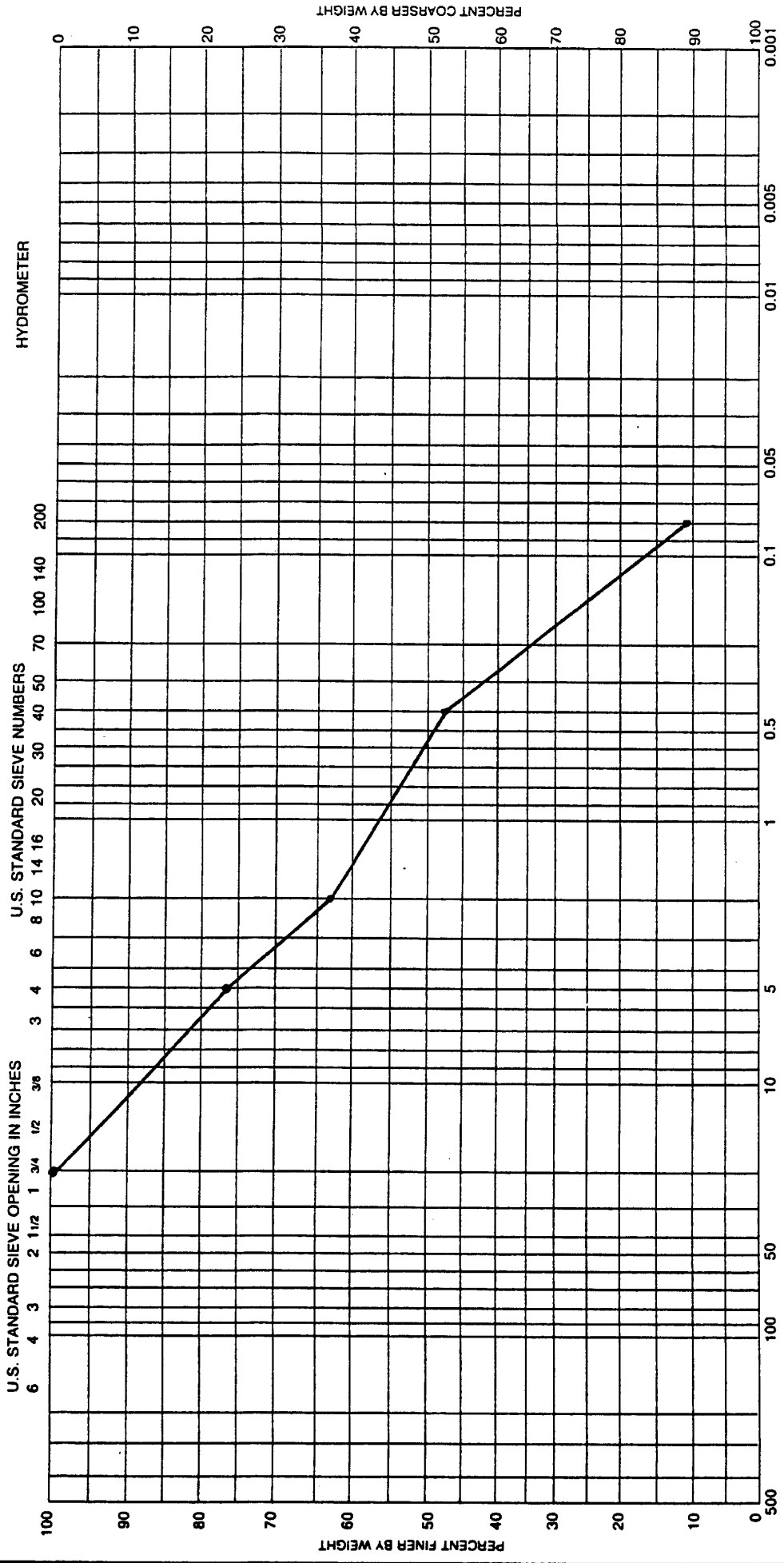


Sample No.	Elev or Depth	Classification	GRAVEL			SAND			FINE	
			COARSE	FINE	COARSE	NEUTRAL	NET W %			
MW-6 - 22	115'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)					Net w %	LL	PL	PI
							28	24	4	

COBBLES		SILT OR CLAY			
Project		Amarillo MSW-LF			
Area					
Boring No.		MW-6			
Date		7-8-94			

GRADATION CURVES

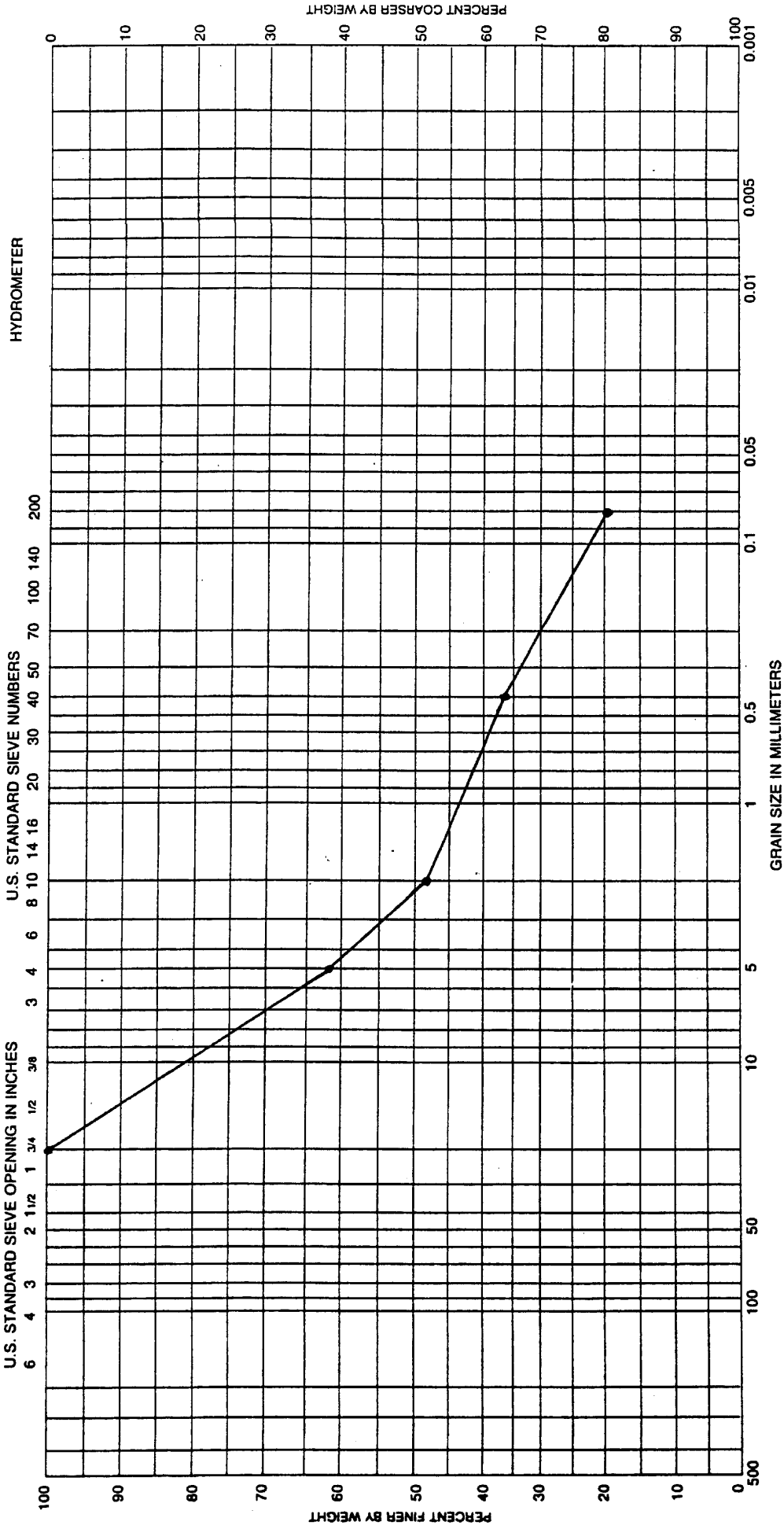




Sample No.	Elev or Depth	Classification	GRAVEL			SAND			FINE			PI
			COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI		
MW-6 - 23	125'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)						26	21	5		

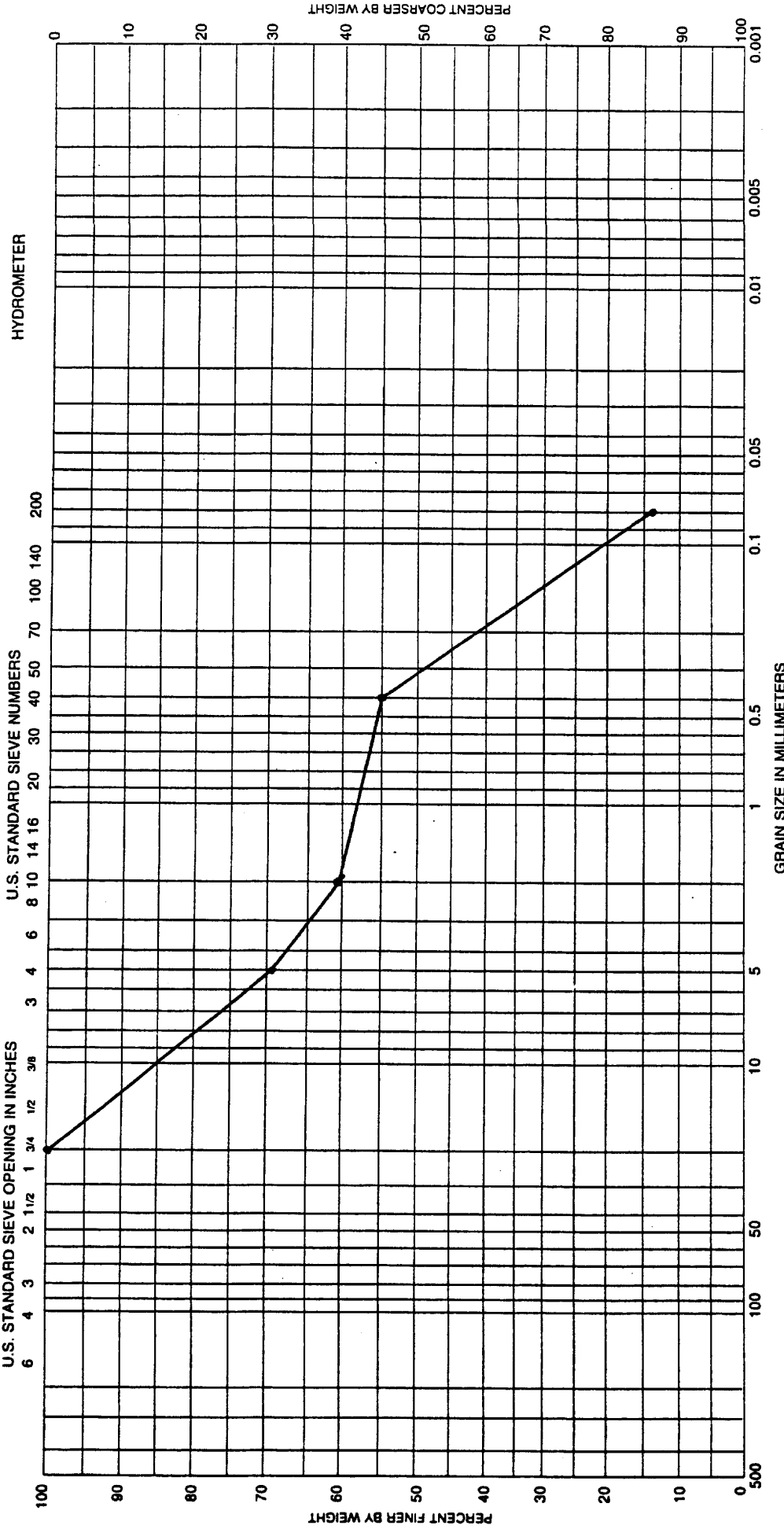
GRADATION CURVES

Project: Amarillo MSW-LF  
 Area:  
 Boring No.: MW-6  
 Date: 7-8-94



Sample No.	Elev or Depth	Classification	SAND			PI	Project
			Net w %	LL	PL		
MW-6-24	135'	Sand: Tan With Scattered Calcareous Nodules (SC)	19	16	3	Amarillo MSWLF	
						Area	
						Boring No. MW-6	
						Date 7-8-94	

GRADATION CURVES

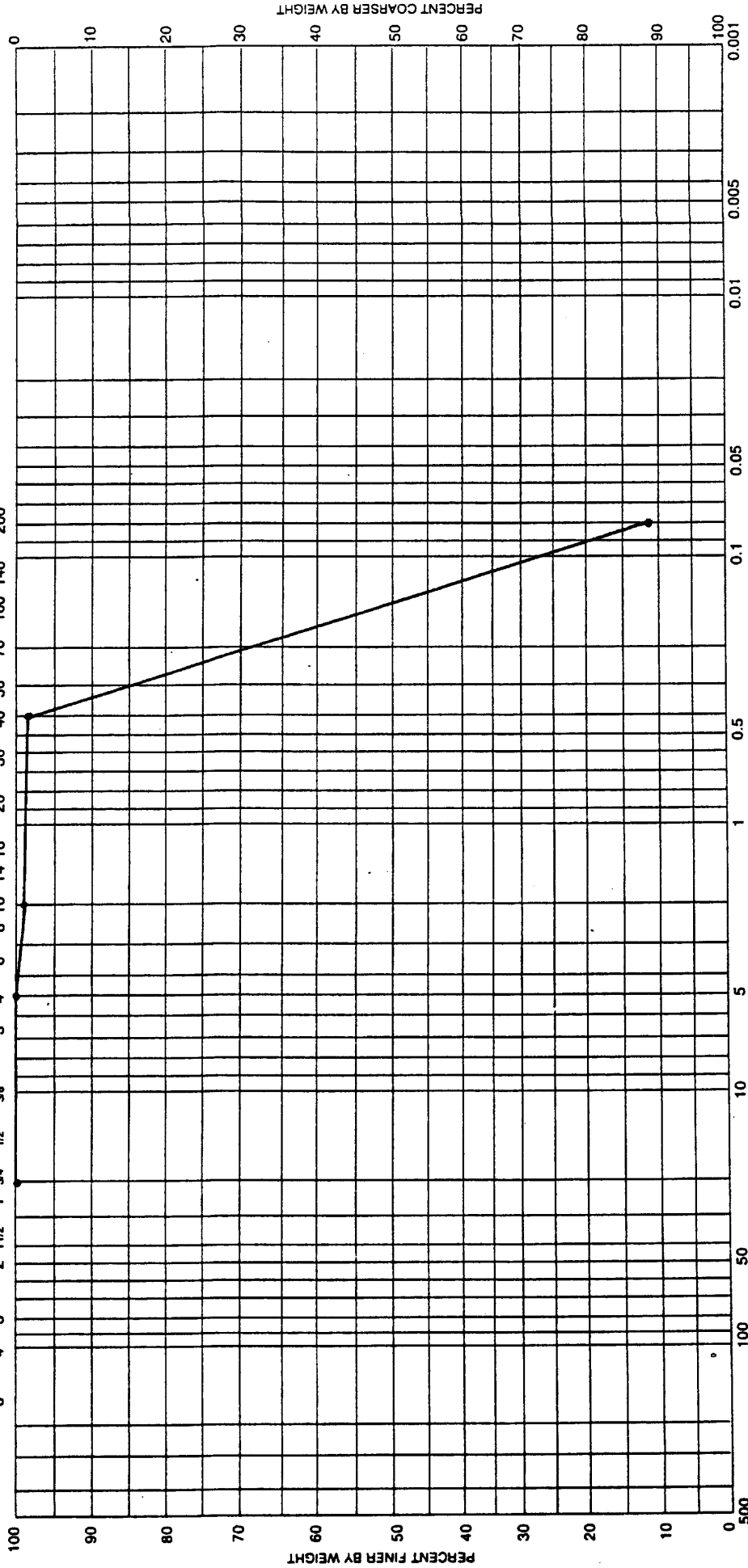


COBBLES		GRAVEL		SAND		SILT OR CLAY	
COARSE		FINE		NEUTRAL		FINE	
Sample No.	Elev or Depth	Classification					
MW-6 - 25	145'	Sand: Tan With Scattered Calcareous Nodules (SC)					
		Net w %	LL	PL	PI	Project	
					NP	Amarillo MSW-LF	
						Area	MW-6
						Boring No.	
						Date	7-8-94

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

COBBLES	GRAVEL		SAND		SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project	Amarillo	MSW-LF
MM-6 - 26	155'	Sand: Tan, Well Sorted With Scattered Calcareous Nodules (SC)				NP			
							Date	7-8-94	

GRADATION CURVES

LOG OF BORING

PZ - 1

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-1  
 LOCATION: Amarillo, Texas

Date: 7-30-94 thru 8-2-94

Ground Elevation: 3808.04'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE	
			GROUNDWATER INFORMATION: Air Drilled to 199' Mud Drilled to 245'										
			DESCRIPTION OF STRATUM										
0			Sandy Clay: Brown (CL)										94.7
			Sandy Clay: Reddish Brown (CL)										
5		X	Sandy Clay: Reddish Tan with Scattered Calcareous Nodules Stiff, Dry (CL)										92.1
			50-6"	7.9	32	15	17	2.50					
10		X	17-6"										86.1
			30-12"										
			50-18"										
15		X	21-6"										86.1
			50-12"										
20		X	50-5"										87.2
25		X	12-6"										91.6
			25-12"										
			50-18"										
30													

Continued on Page 2

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-1  
 LOCATION: Amarillo, Texas

Date: 7-30-94 thru 8-2-94

Ground Elevation: 3808.04'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 199' Mud Drilled to 245'									
			DESCRIPTION OF STRATUM									
30	/	X										
35	/	X										
40	/	X										
45	/	X										
50	/	X										
55	/	X	Caliche: Light Tan Limestone, Layers, Fractures, Hard (CL)									
60	/	X	Continued on Page 3									

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-1  
 LOCATION: Amarillo, Texas

Date: 7-30-94 thru 8-2-94

Ground Elevation: 3808.04'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 199' Mud Drilled to 245'								
60	/	X		50-4"	6.1						
65	•										
70	/	X	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Stiff Dry (SC)	50-3"	4.8						52.1
75	/	X		50-4"	5.0						
80	/	X		50-3"	4.7		27	16	11		41.5
85	/	X		50-6"	5.1		24	18	6		28.4
90	/										

Continued on Page 4



## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-1  
 LOCATION: Amarillo, Texas

Date: 7-30-94 thru 8-2-94

Ground Elevation: 3808.04'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 199' Mud Drilled to 245'									
			DESCRIPTION OF STRATUM									
90	[Symbol: Diagonal lines and dots]	X										
			22-6"									
			50-12"									
95	[Symbol: Diagonal lines and dots]	X										
			50-6"									
100	[Symbol: Diagonal lines and dots]	X										
			50-6"									
105	[Symbol: Diagonal lines and dots]	X	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Stiff, Dry (SC)									
110	[Symbol: Diagonal lines and dots]	X										
			50-3"									
115	[Symbol: Diagonal lines and dots]	X										
120	[Symbol: Diagonal lines and dots]	X										

Continued on Page 5

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-1  
 LOCATION: Amarillo, Texas

Date: 7-30-94 thru 8-2-94

Ground Elevation: 3808.04'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 199' Mud Drilled to 245'								
			DESCRIPTION OF STRATUM								
120	(Symbol: Diagonal lines and dots)	(Symbol: X)	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Stiff, Dry (SC)	31-6"	4.0				NP		15.1
				50-7							
125	(Symbol: Diagonal lines and dots)	(Symbol: X)									
130	(Symbol: Diagonal lines and dots)	(Symbol: X)									
135	(Symbol: Diagonal lines and dots)	(Symbol: X)									
140	(Symbol: Diagonal lines and dots)	(Symbol: X)		50-6"	3.2				NP		17.4
145	(Symbol: Diagonal lines and dots)	(Symbol: X)									
150	(Symbol: Diagonal lines and dots)	(Symbol: X)									

Continued on Page 6

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-1  
 LOCATION: Amarillo, Texas

Date: 7-30-94 thru 8-2-94

Ground Elevation: 3808.04'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 199' Mud Drilled to 245'								
150	•••••	X		35-6"							
				50-8"							
155											
160	•••••	X	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Stiff, Dry (SC)	39-6"	2.9				NP		16.1
				50-8"							
165											
170	•••••	X		50-6"	14.6						
175											
180											

Continued on Page 7

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-1  
 LOCATION: Amarillo, Texas

Date: 7-30-94 thru 8-2-94

Ground Elevation: 3808.04'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT. PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 199' Mud Drilled to 245'								
			DESCRIPTION OF STRATUM								
180	•••••	X		50-4"	2.9				NP		13.0
185	•••••										
190	•••••	X		50-3"							
195	•••••										
200	•••••	X		50-4"	MD				NP		14.5
205	•••••		Sand: Tan, Fine Grain w/Small Pea Gravel (GW)		MD						
210	•••••		Continued on Page 8								

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-1  
 LOCATION: Amarillo, Texas

Date: 7-30-94 thru 8-2-94

Ground Elevation: 3808.04'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 199' Mud Drilled to 245'								
210	•••••	X		50-5"	MD				NP		15.8
215	•••••				MD						
220	•••••	X		50-3"	MD				NP		24.5
225	•••••										
230	•••••	X		50-2"	MD						31.8
235	•••••		Clayey Sand: Tan with Scattered Calcareous Nodules (SC)								
240	•••••										

Continued on Page 9

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-1  
 LOCATION: Amarillo, Texas

Date: 7-30-94 thru 8-2-94

Ground Elevation: 3808.04'

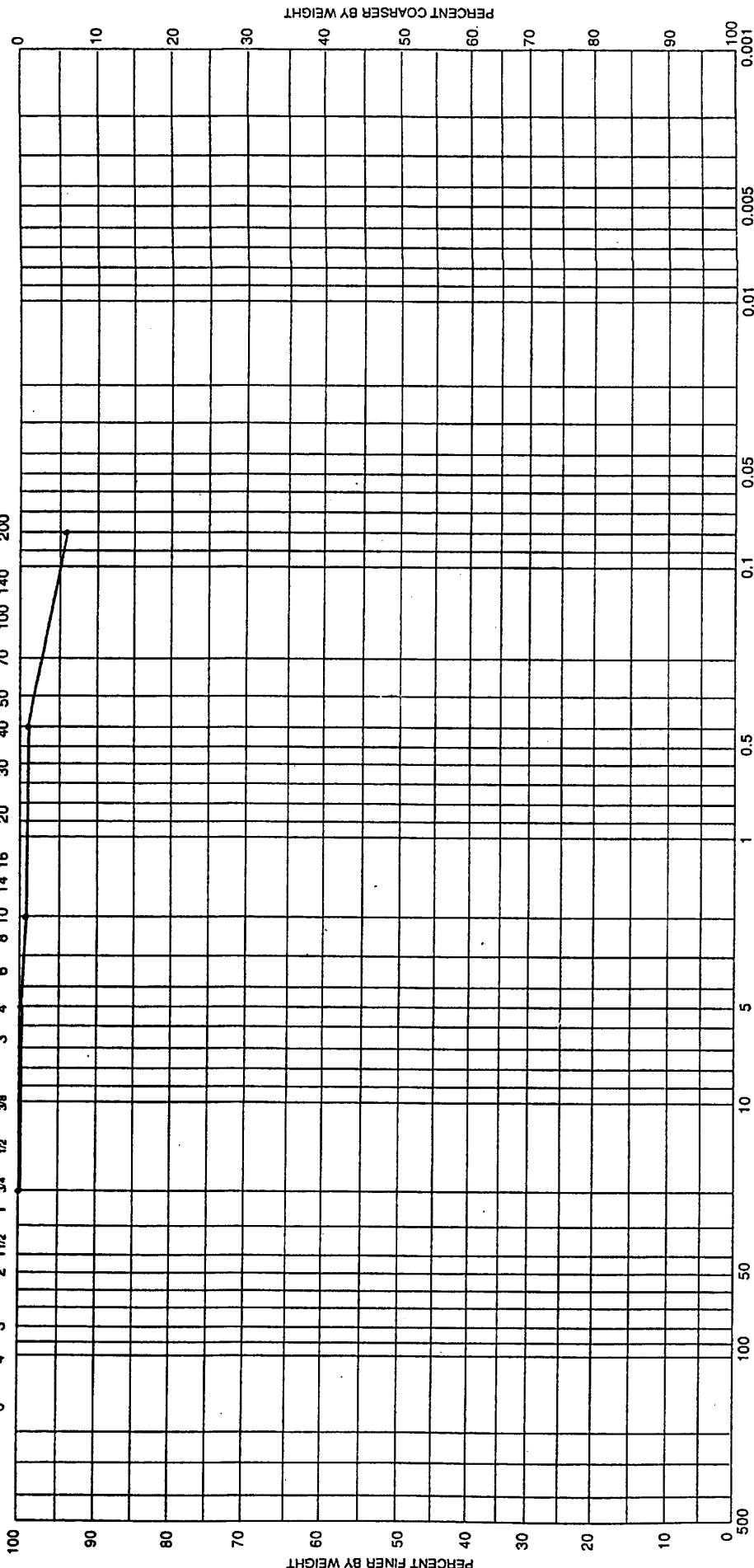
DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Drilled							
			SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
GROUNDWATER INFORMATION: Air Drilled to 199' Mud Drilled to 245'										
DESCRIPTION OF STRATUM										
240	●	△	Clayey Sand: Tan with Scattered Calcareous Nodules (SC)							
245	●		50-3"	MD						25.6
				MD						

\* T.D. - 245' \*

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

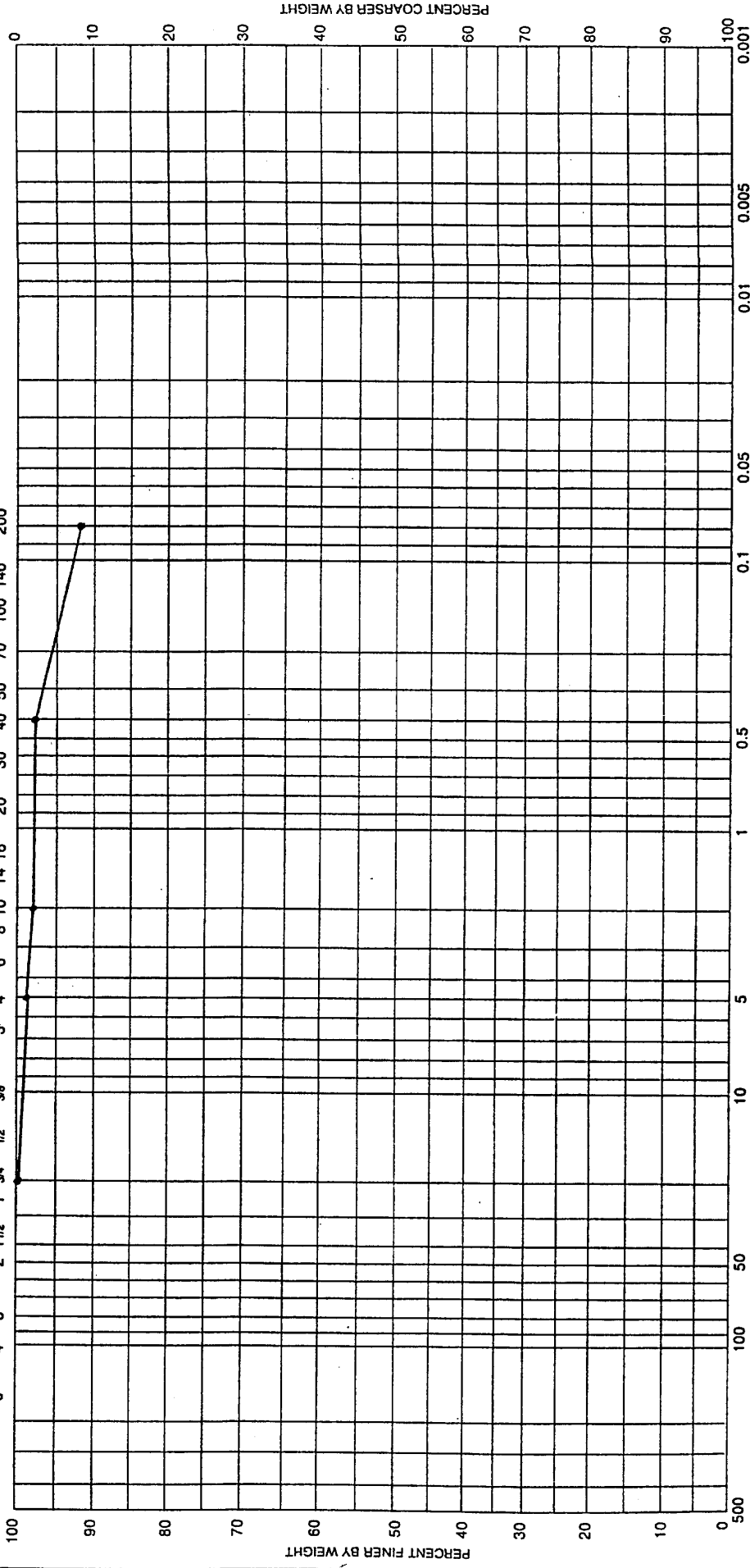


Sample No.	Elev or Depth	Classification	SAND				SILT OR CLAY	
			Net w %	LL	PL	PI	Area	
PZ-1 - 1	0 - 2'	Sandy Clay: Brown (CL)	31	14	17	Project Amarillo MSW-LF		
						Area		
						Boring No. PZ-1		
						Date 7-30-94		
GRADATION CURVES								

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



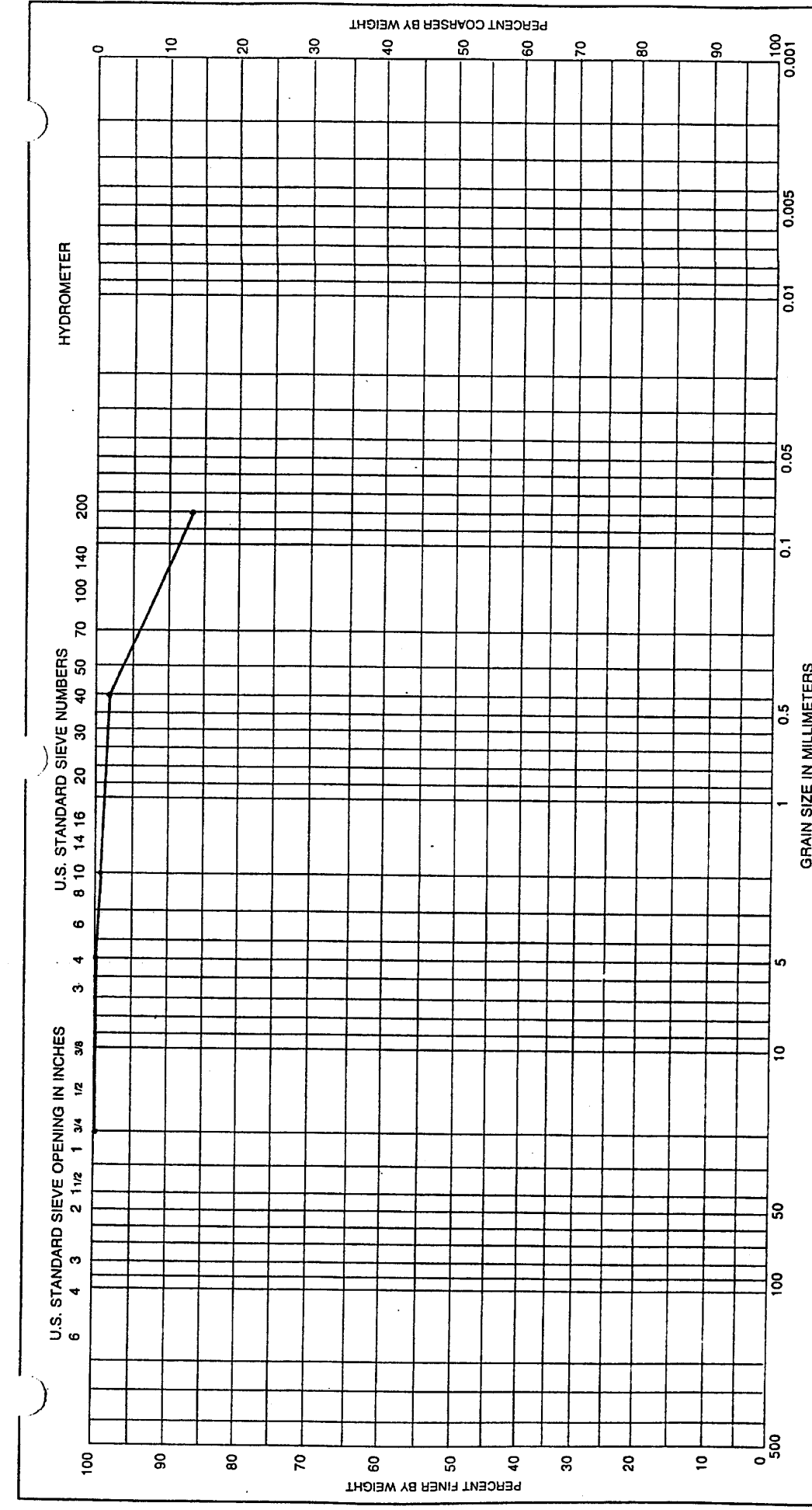
PERCENT COARSER BY WEIGHT

PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

Sample No.	Elev or Depth	GRAVEL				SAND			SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	NET W %	LL	PL	PI	Project
PZ-1 - 2	5'					32	15	17		Amarillo MSW-LF
		Classification: Sandy Clay : Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (Cl)								
		Area								
		Boring No. PZ-1								
		Date 7-30-94								
GRADATION CURVES										



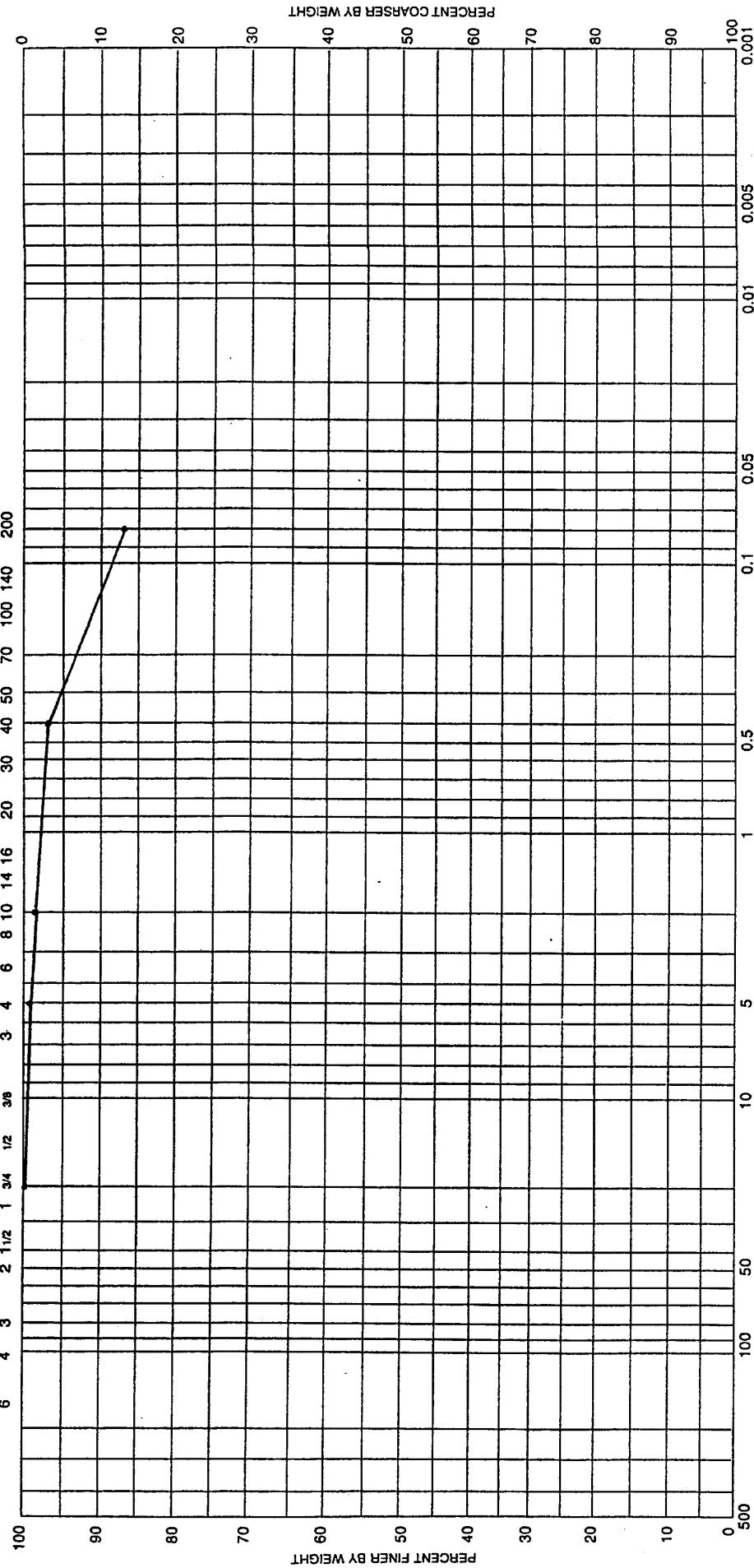


<b>COBBLES</b>		<b>GRAVEL</b>		<b>SAND</b>		<b>SILT OR CLAY</b>	
		COARSE	FINE	NEUTRAL	FINE		
Sample No.	Elev or Depth	Classification					
PZ-1 - 4	15'	Sandy Clay: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (CL)					
		Net w %	LL	PL	PI	Project	Amarillo MSW-LF
			35	13	22		
						Area	
						Boring No.	PZ-1
						Date	7-30-94
<b>GRADATION CURVES</b>							

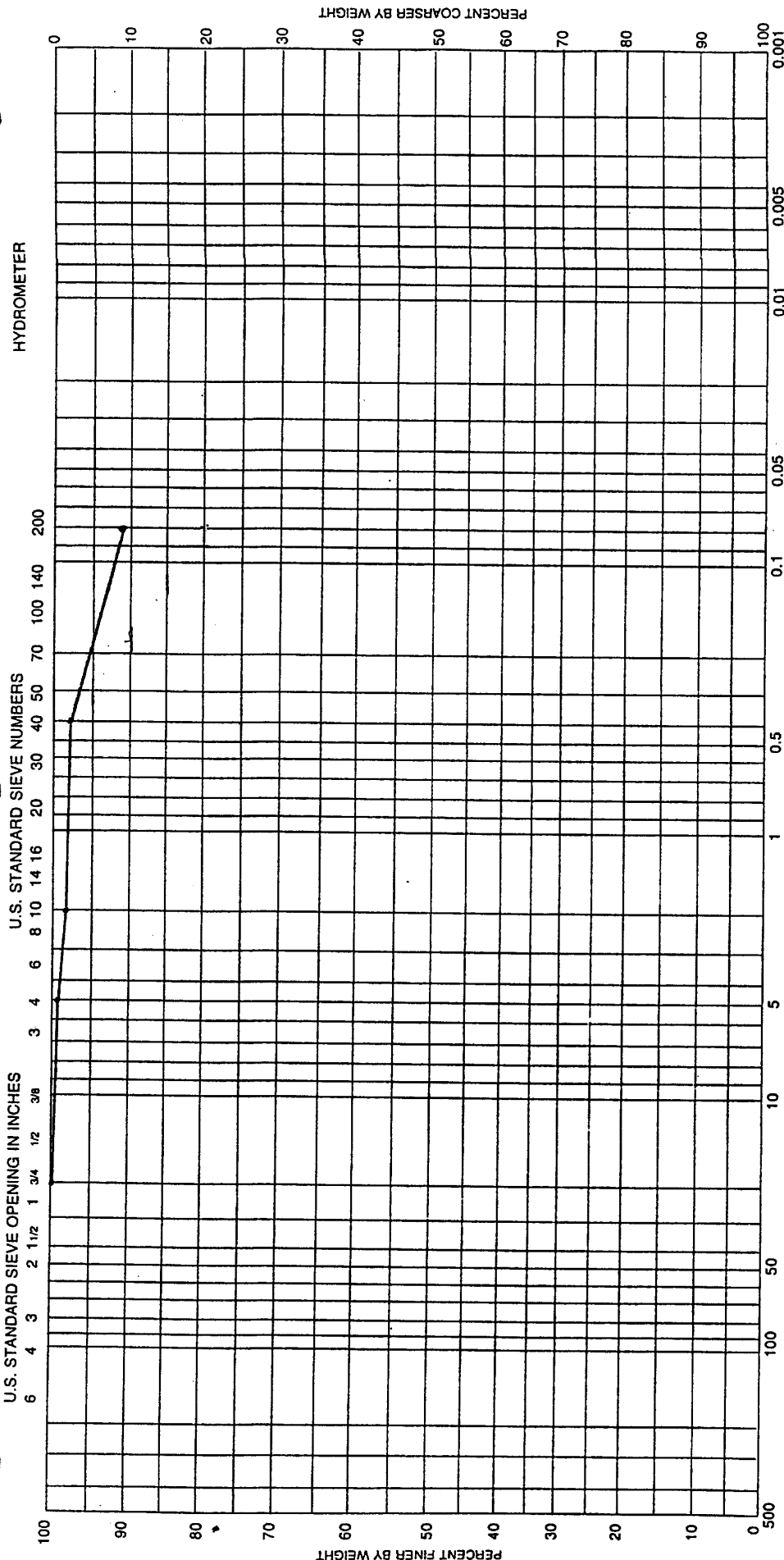
U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



COBBLES		GRAVEL		SAND			SILT OR CLAY	
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project	
PZ-1 - 5	20'	Sandy Clay : Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (CL)	34	17	17		Amarillo	MSW-LF
							Area	
							Boring No.	PZ-1
							Date	7-30-94
GRADATION CURVES								



U.S. STANDARD SIEVE OPENING IN INCHES		U.S. STANDARD SIEVE NUMBERS	
6	4	4	3
4	3	3	2
3	2	2	1 1/2
2	1 1/2	1 1/2	1
1 1/2	1	1	3/4
1	3/4	3/4	1/2
3/4	1/2	1/2	3/8
1/2	3/8	3/8	5/16
3/8	5/16	5/16	3/16
5/16	3/16	3/16	1/4
1/4	1/4	1/4	1/8
1/8	1/8	1/8	1/16
1/16	1/16	1/16	1/32
1/32	1/32	1/32	1/64
1/64	1/64	1/64	1/128

Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
PZ-1 - 6	25'	Sandy Clay : Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (CL)		32	20	12

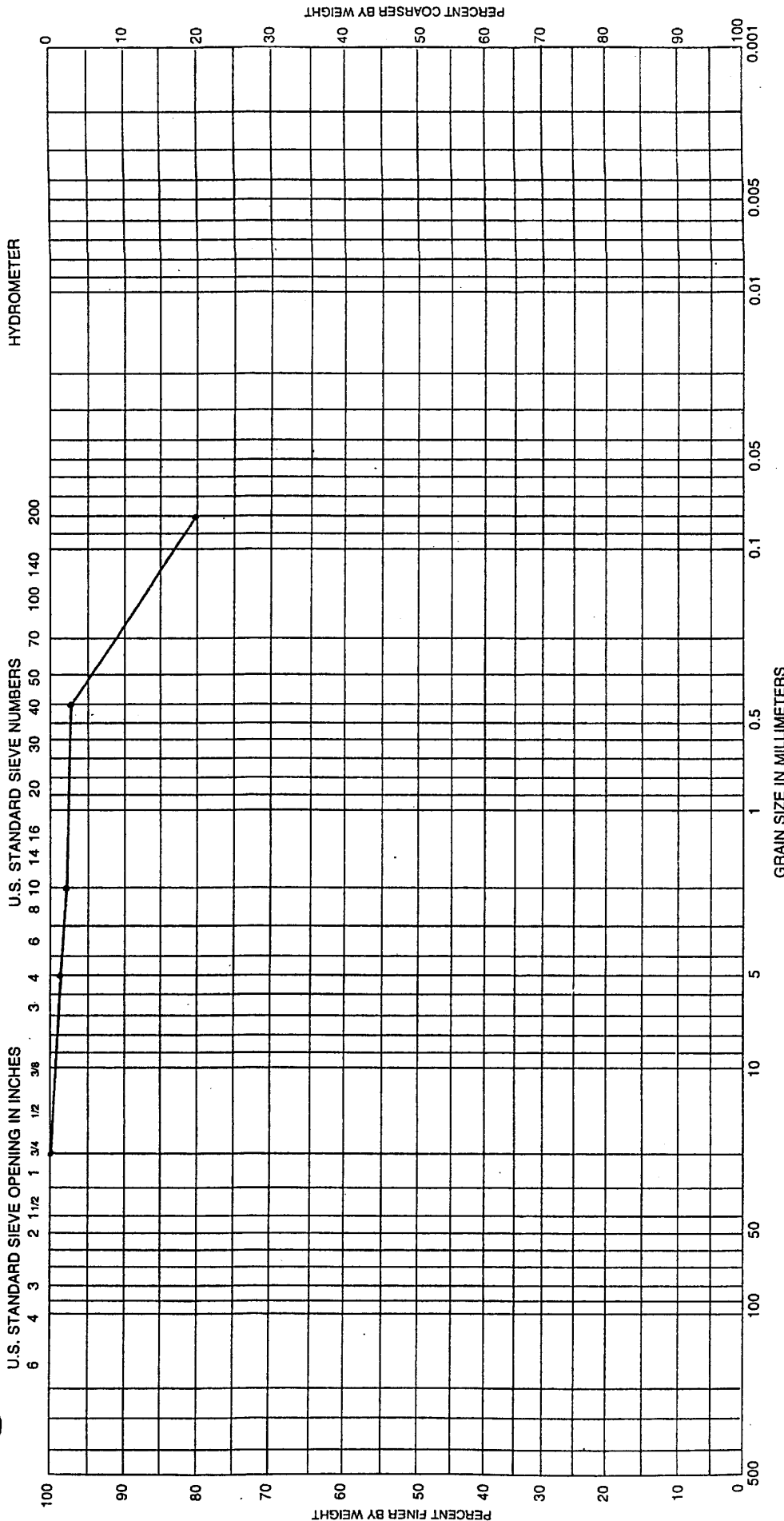
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE		

Project	Amarillo MSW-LF
Area	
Boring No.	PZ-1
Date	7-30-94

GRADATION CURVES	



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

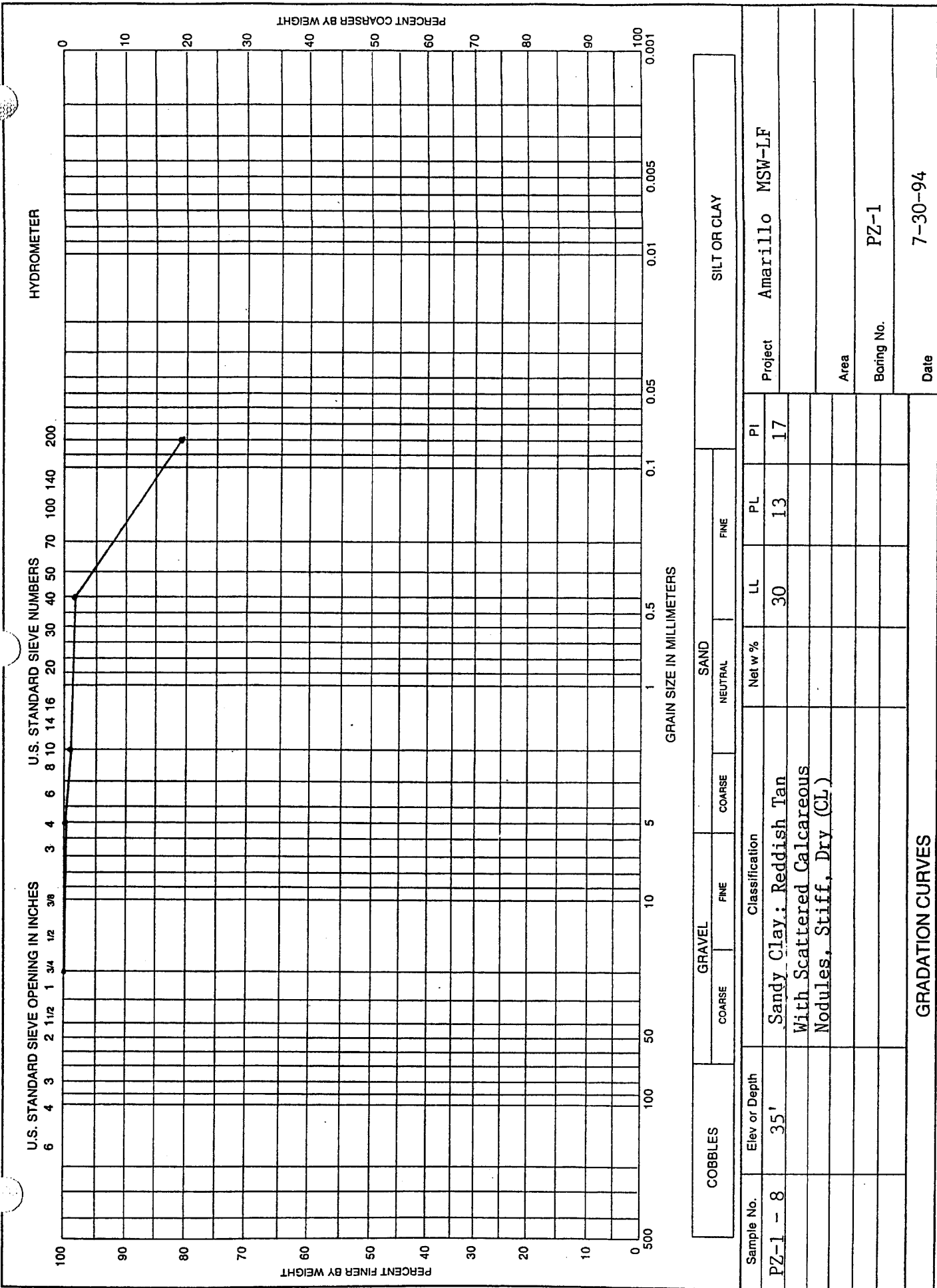
PERCENT COARSER BY WEIGHT

PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

Sample No.	Elev or Depth	Classification	SAND			PI	PL	Project
			Net w %	LL	PL			
PZ-1 - 7	30'	Sandy Clay : Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (CI)	31	31	15	16	Amarillo MSW-LF	
							Area	
							Boring No. PZ-1	
							Date 7-30-94	

GRADATION CURVES



Project **Amarillo MSW-LF**

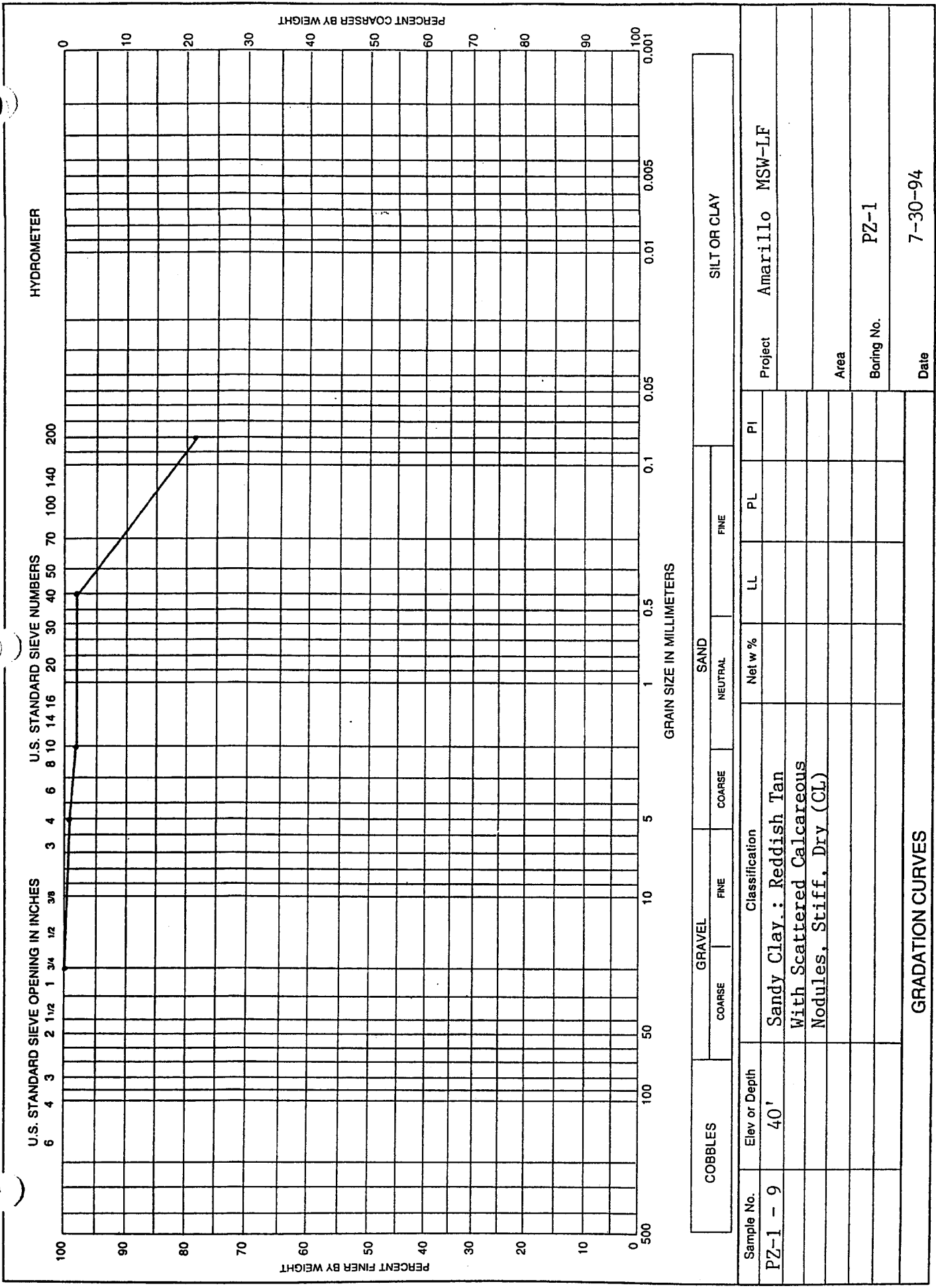
Area

Boring No. **PZ-1**

Date **7-30-94**

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
PZ-1 - 8	35'	Sandy Clay; Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (CL)		30	13	17

**GRADATION CURVES**



GRADATION CURVES

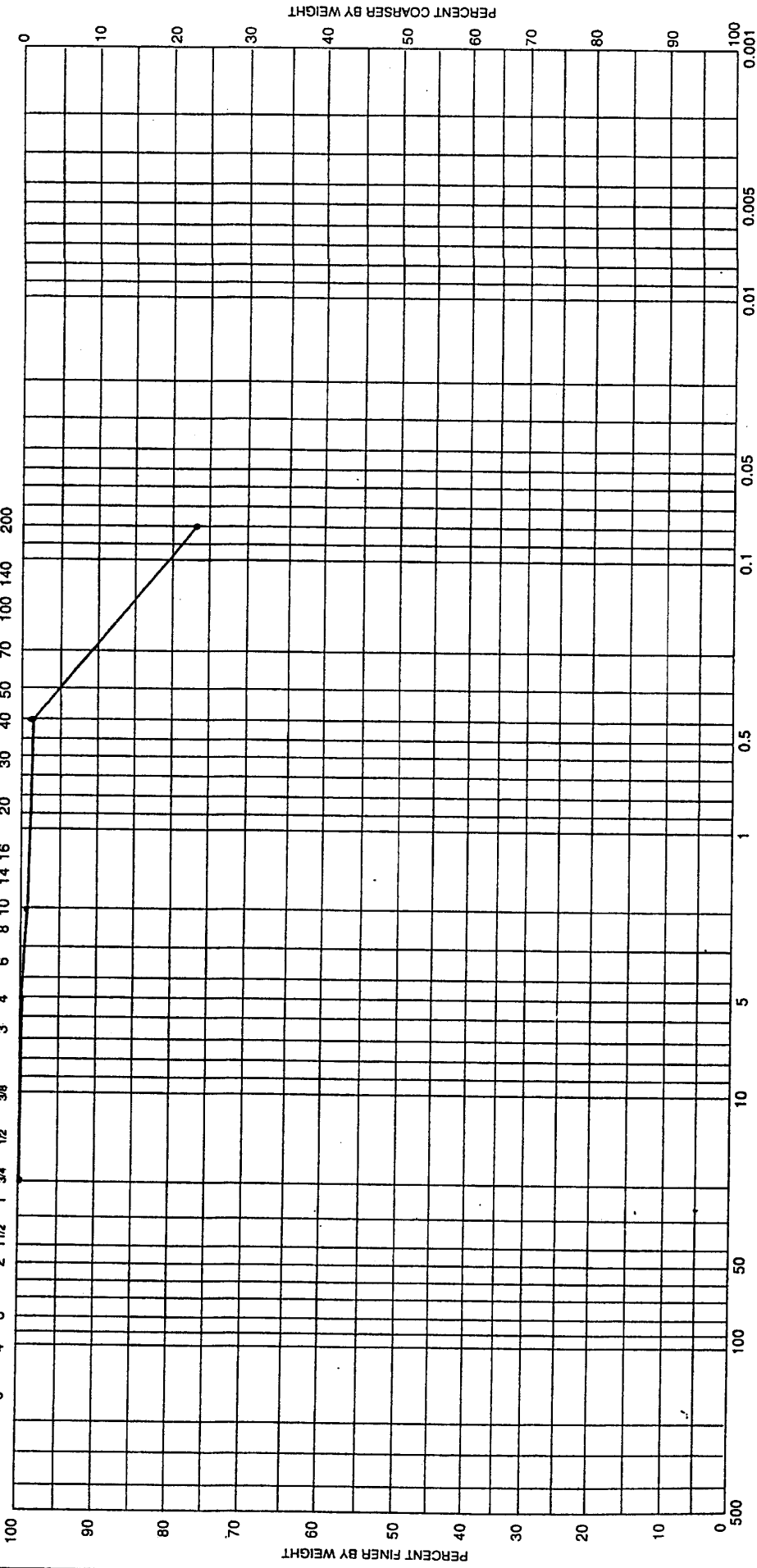
Sample No.	Elev or Depth	Classification	SAND			GRAVEL			SILT OR CLAY
			Net w %	LL	PL	PI	COARSE	FINE	
PZ-1 - 9	40'	Sandy Clay.: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (CL)							

Project	Amarillo	MSW-LF
Area		
Boring No.	PZ-1	
Date	7-30-94	

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

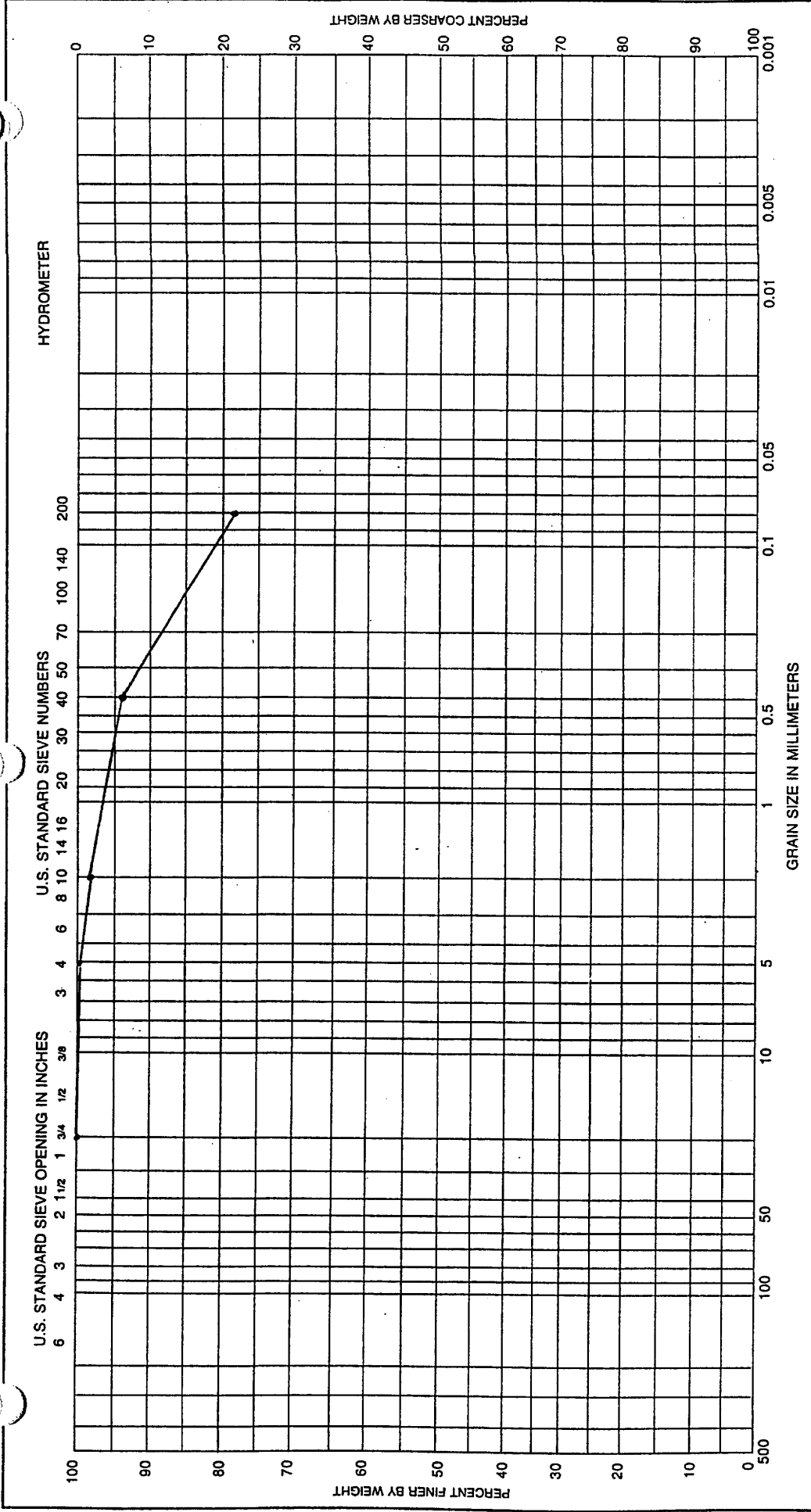
U.S. STANDARD SIEVE OPENING IN INCHES



COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
PZ-1 - 10	45'	Sandy Clay ; Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (CL)		31	20	11
Project Amarillo MSW-LF						
Area						
Boring No. PZ-1						
Date 7-30-94						

GRADATION CURVES



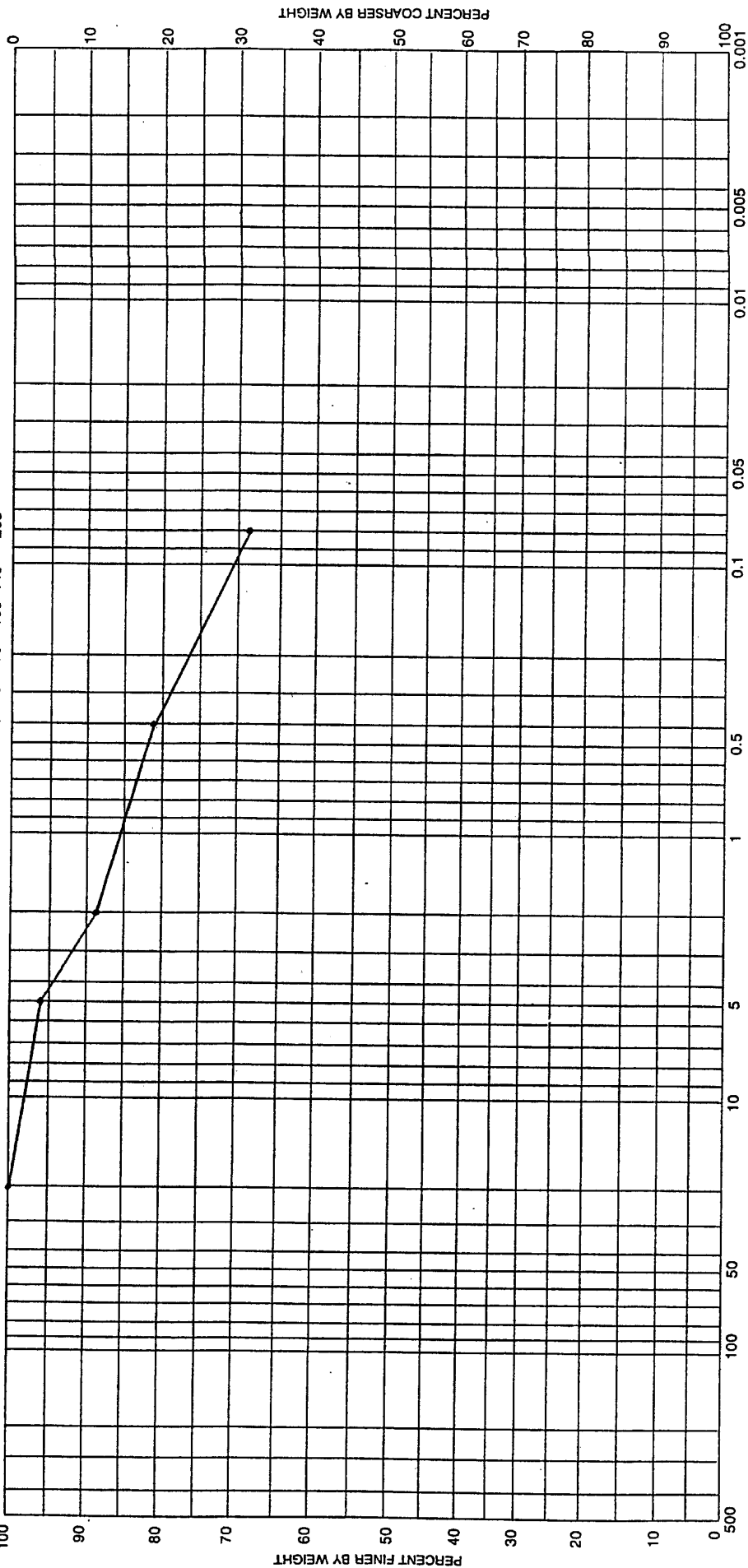
COBBLES		GRAVEL		SAND			SILT OR CLAY		
		COARSE	FINE	COARSE	NEUTRAL	FINE			
Sample No.	Elev or Depth	Classification							
PZ-1 - 11	50'	Caliche: Light Tan Limestone, Layers, Fractures, Hard (CL)							
		Net w %	LL	PL	PI				
			35	19	16				
		Area							
		Boring No. PZ-1							
		Date 7-30-94							
GRADATION CURVES									
Project Amarillo MSW-LF									



U.S. STANDARD SIEVE OPENING IN INCHES  
 6 4 3 2 1 1/2 1 3/4 1/2 3/8 3/16

HYDROMETER

U.S. STANDARD SIEVE NUMBERS  
 20 30 40 50 60 70 100 140 200



PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE		

Sample No.	Elev or Depth	Classification	LL	PL	PI
PZ-1 - 12	55'	Caliche: Light Tan. Limestone, Fractures, Hard (CL)	30	19	11

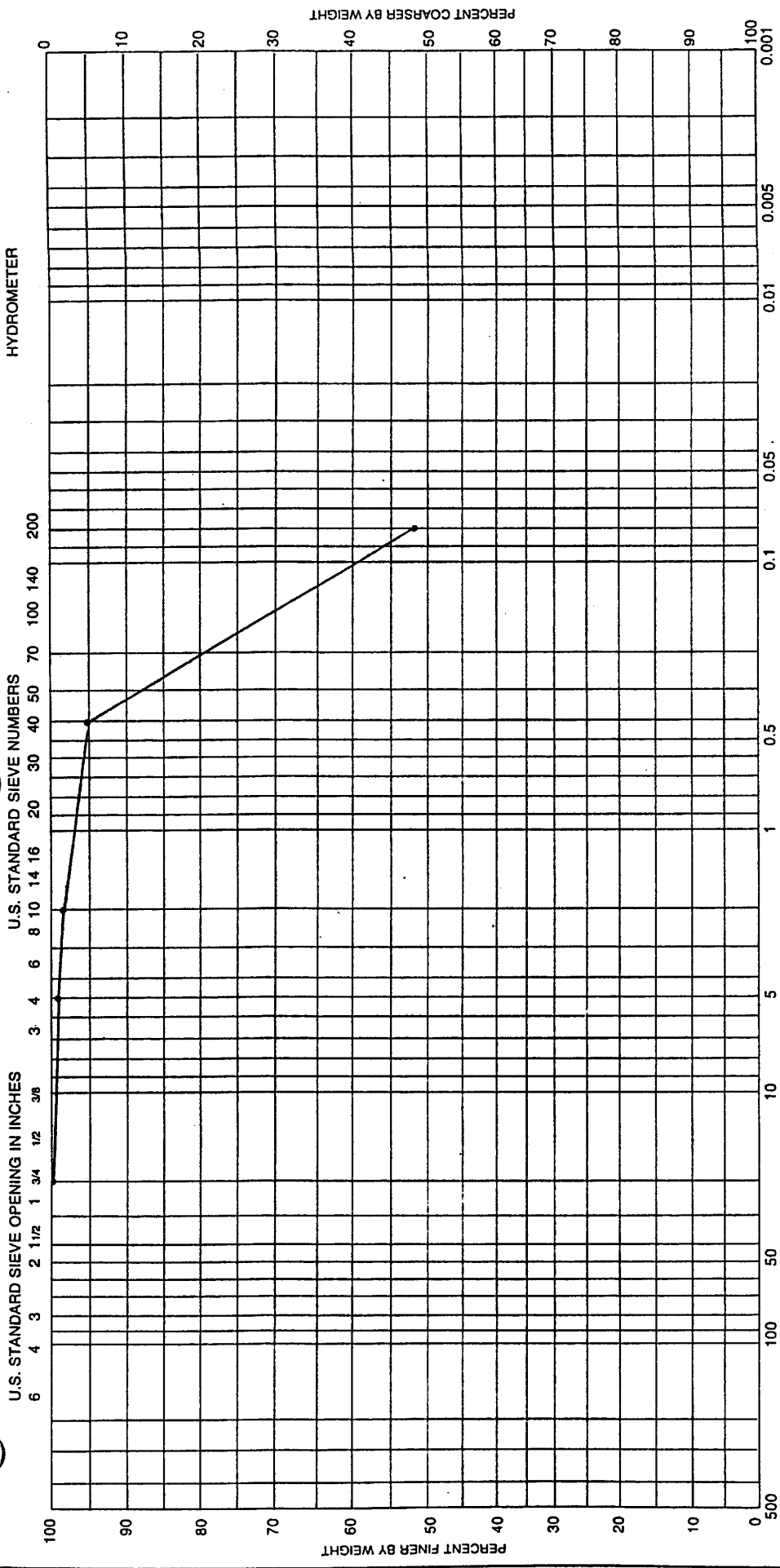
Project Amarillo MSW-LF

Area PZ-1

Boring No. PZ-1

Date 7-30-94

GRADATION CURVES



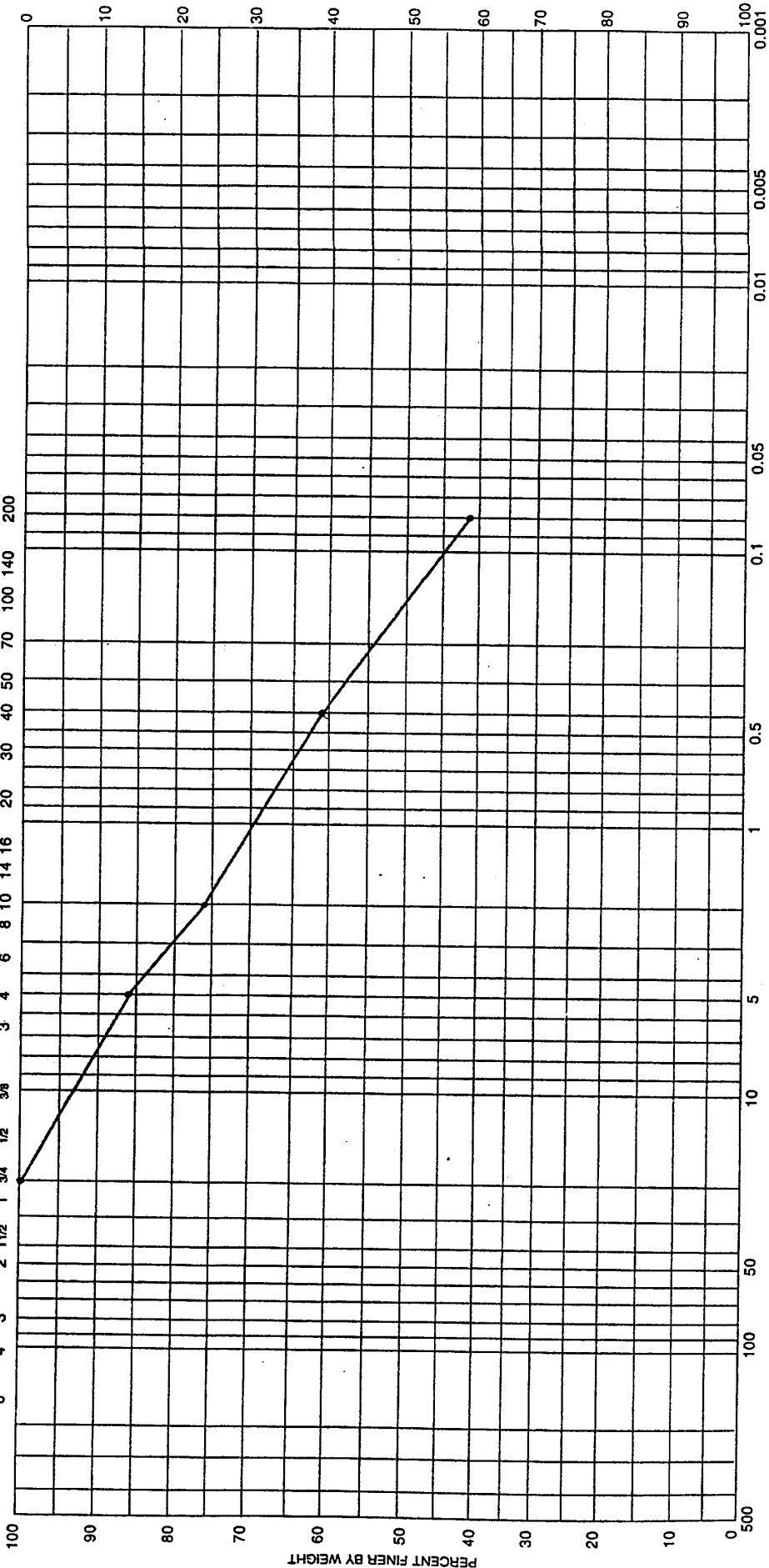
GRAVEL		SAND		SILT OR CLAY	
COARSE	FINE	NEUTRAL	FINE		
COARSE	FINE	LL	PL	Project	MSW-LF
Classification					
Clayey Sand; Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)					
Sample No.	Elev or Depth				
PZ-1 - 15	70'				
				Area	
				Boring No.	
				PZ-1	
				Date	
				7-30-94	
<b>GRADATION CURVES</b>					

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

PERCENT COARSER BY WEIGHT



PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

U.S. STANDARD SIEVE OPENING IN INCHES

100 90 80 70 60 50 40 30 20 10 0

6 4 3 2 1 1/2 1 3/4 1/2 3/8

3 4 6 8 10 14 16 20 30 40 50 70 100 140 200

U.S. STANDARD SIEVE NUMBERS

PERCENT FINER BY WEIGHT

COBBLES

GRAVEL

SAND

SILT OR CLAY

COARSE

FINE

COARSE

FINE

NEUTRAL

Net w %

LL

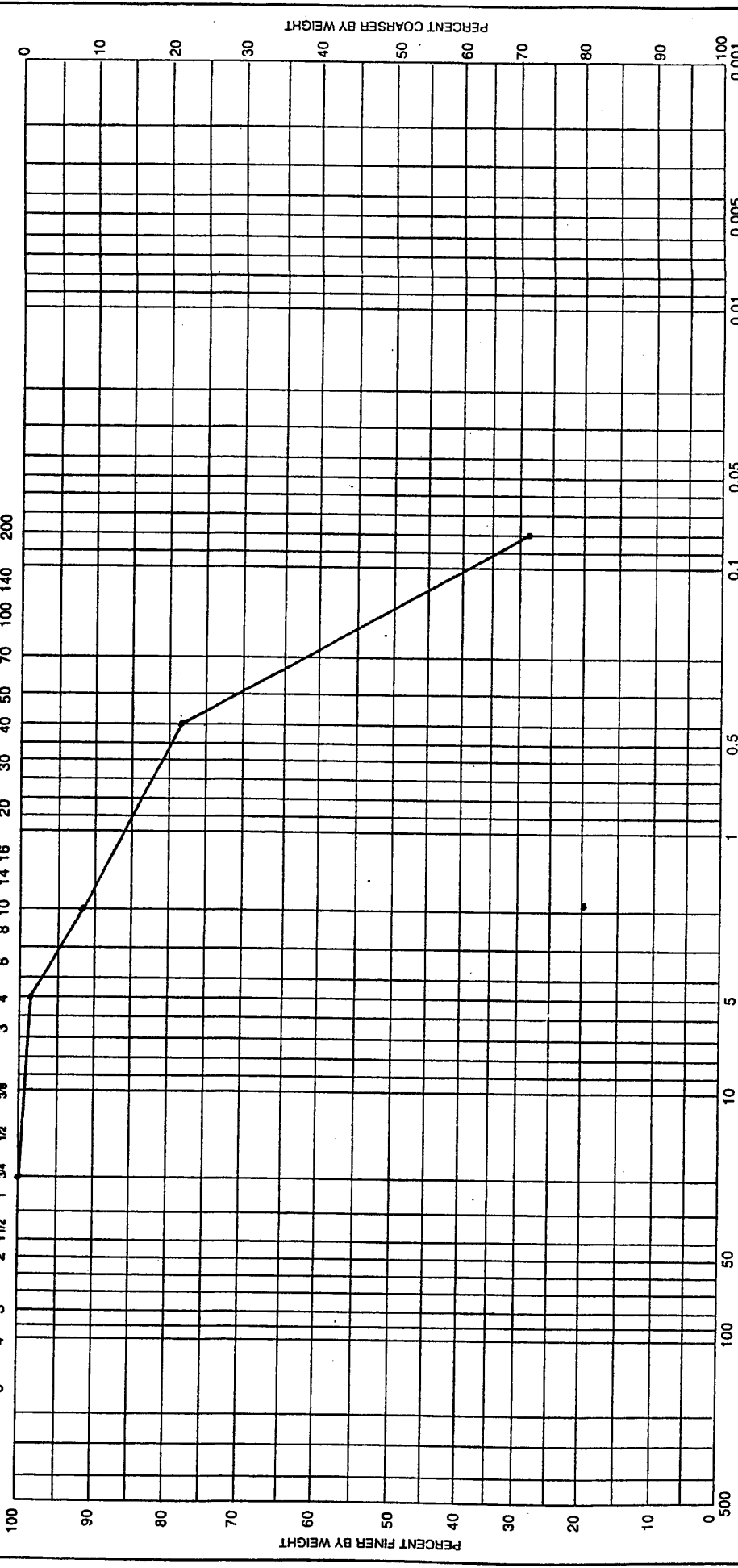
PL

PI

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
PZ-1 - 17	80'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)		27	16	11
GRADATION CURVES						

Project	Amarillo MSW-LF
Area	
Boring No.	PZ-1
Date	7-30-94

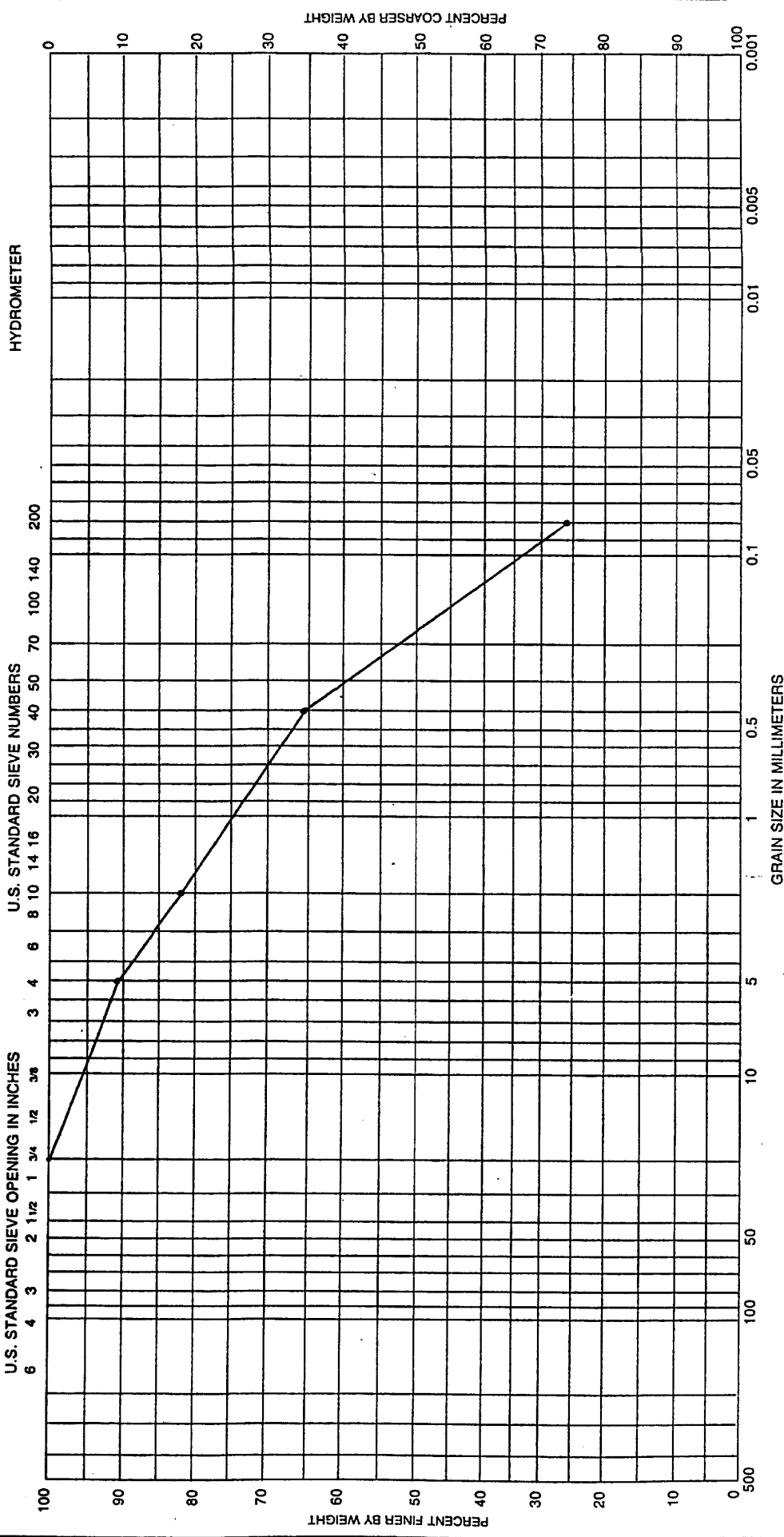
U.S. STANDARD SIEVE OPENING IN INCHES  
 6 4 3 2 1 1/2 1 3/4 1/2 3/8  
 U.S. STANDARD SIEVE NUMBERS  
 100 90 80 70 60 50 40 30 20 10 0



HYDROMETER

PERCENT COARSER BY WEIGHT

COBBLES		GRAVEL		SAND			SILT OR CLAY		
		COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI
Sample No.	Elev or Depth	Classification							
PZ-1 - 18	85'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)							
		Net w %	LL	PL	PI				
			24	18	6				
		Area							
		Boring No.	PZ-1						
		Date	7-30-94						
GRADATION CURVES									



Sample No.	Elev or Depth	Classification	SAND			LL	PL	PI
			COARSE	FINE	NEUTRAL			
PZ-1 - 20	95'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)				21	16	5

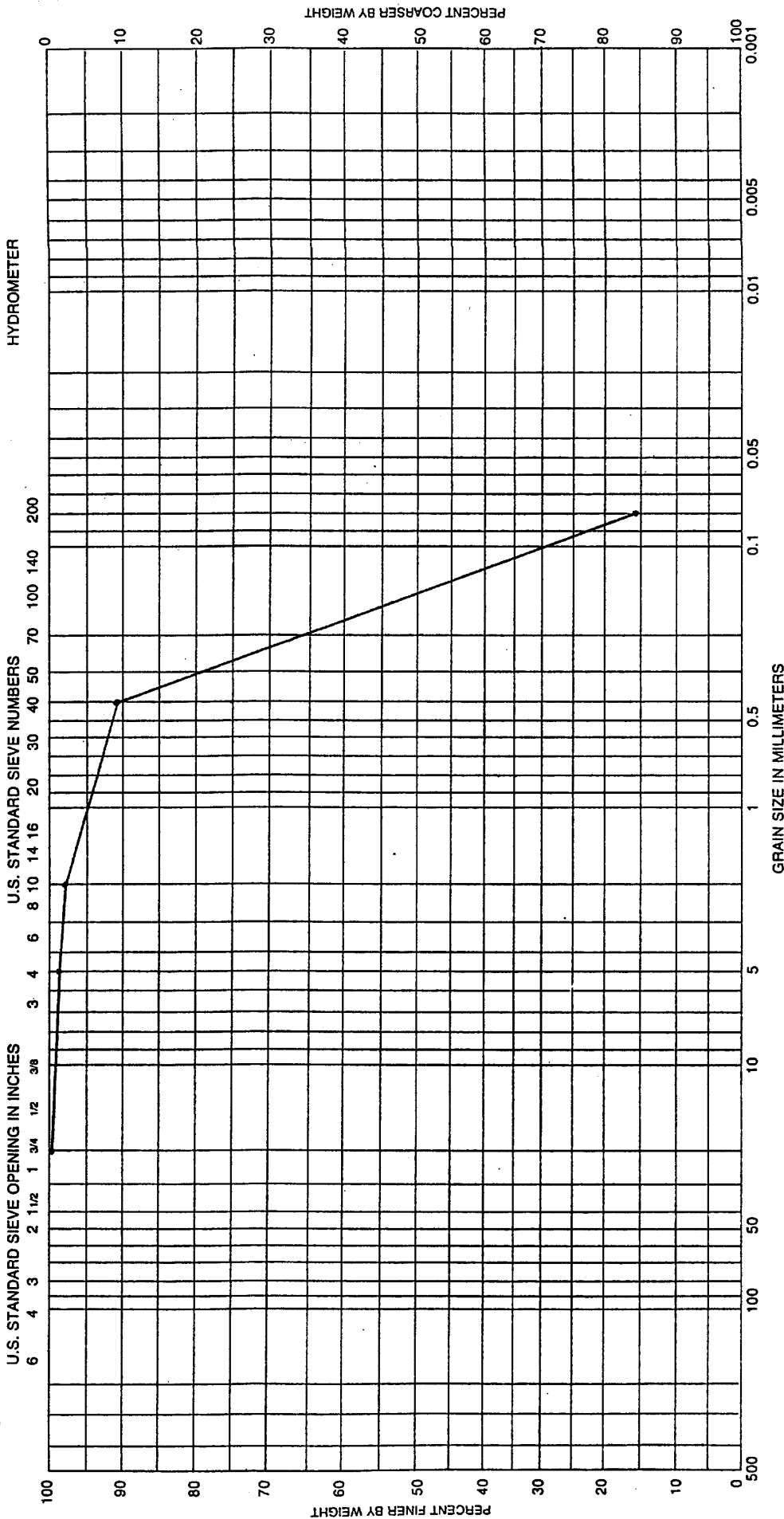
  

COBBLES		GRAVEL		SAND		SILT OR CLAY	

Project	Amarillo MSW-LF
Area	
Boring No.	PZ-1
Date	7-30-94

GRADATION CURVES



Sample No.	Elev or Depth	Classification	SAND			GRAVEL		Net w %	LL	PL	PI
			COARSE	NEUTRAL	FINE	COARSE	FINE				
PZ-1 - 21	100'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)						21	17	4	

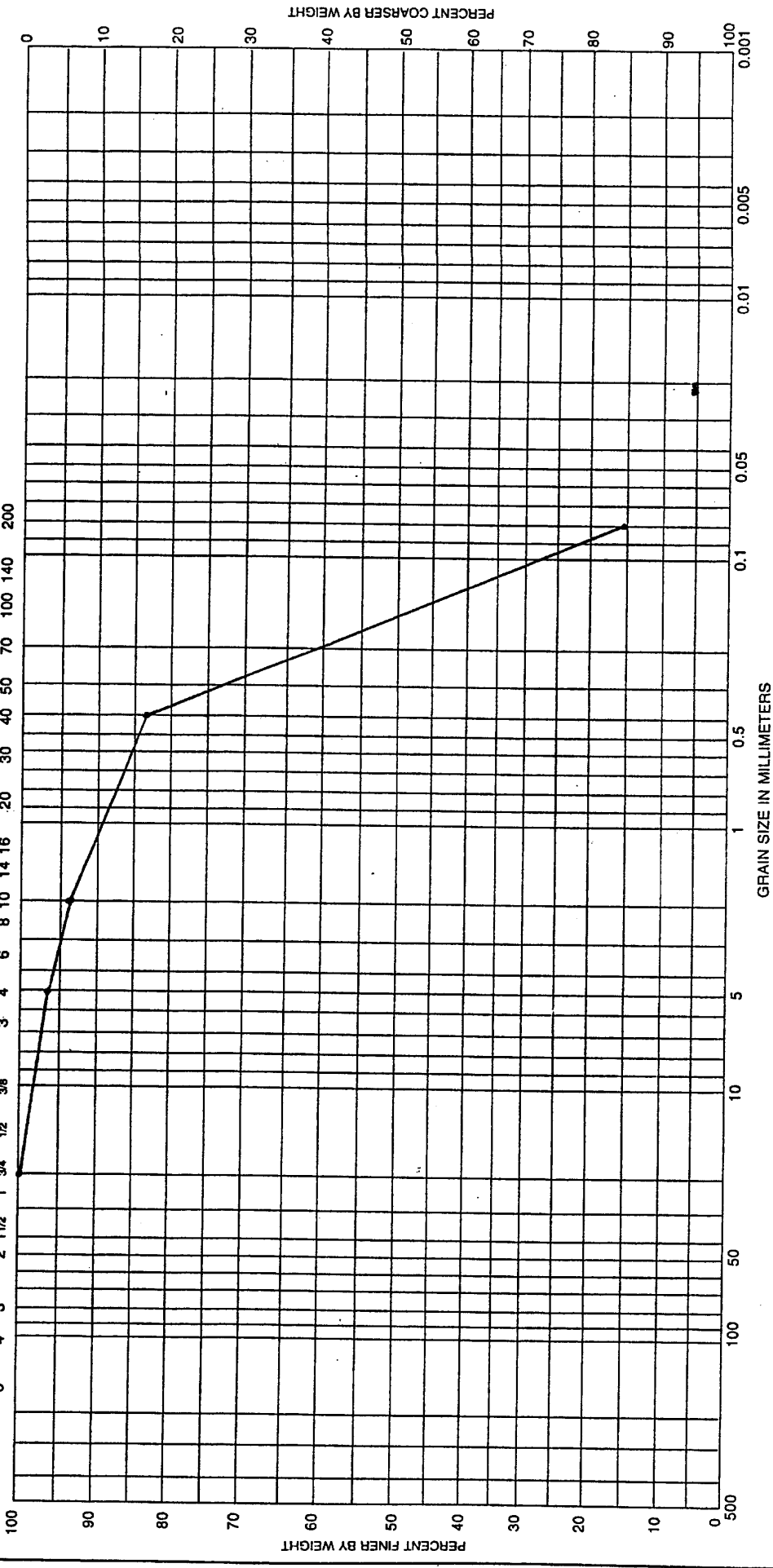
Project: Amarillo MSW-LF  
 Area:  
 Boring No.: PZ-1  
 Date: 7-30-94

GRADATION CURVES

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



Sample No.	Elev or Depth	GRAVEL			SAND			PI
		COARSE	FINE	COARSE	NEUTRAL	FINE		

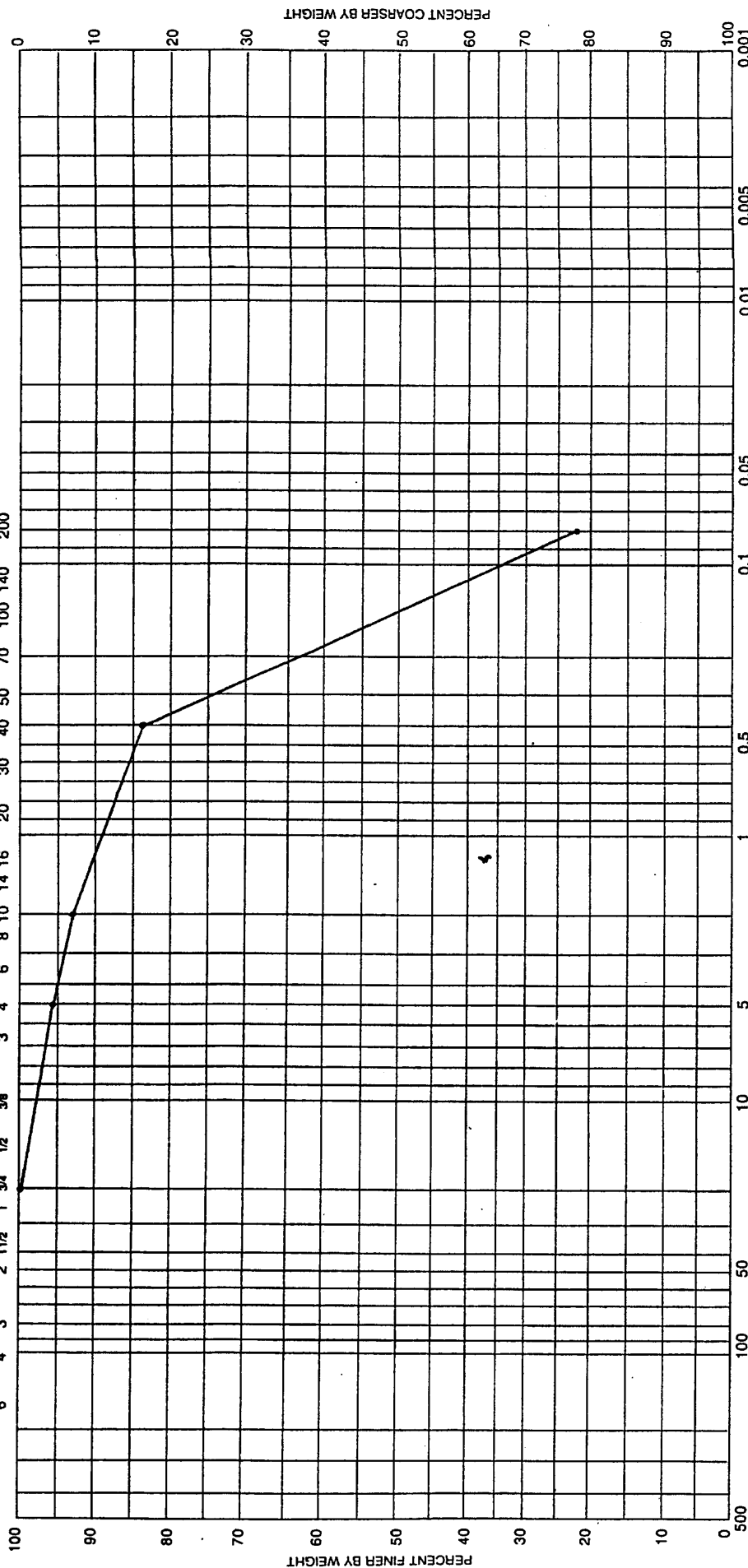
Pz-1 - 25	120'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)			Net w %	LL	PL	NP

GRADATION CURVES	
Project	Amarillo MSW-LF
Area	
Boring No.	PZ-1
Date	7-30-94

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

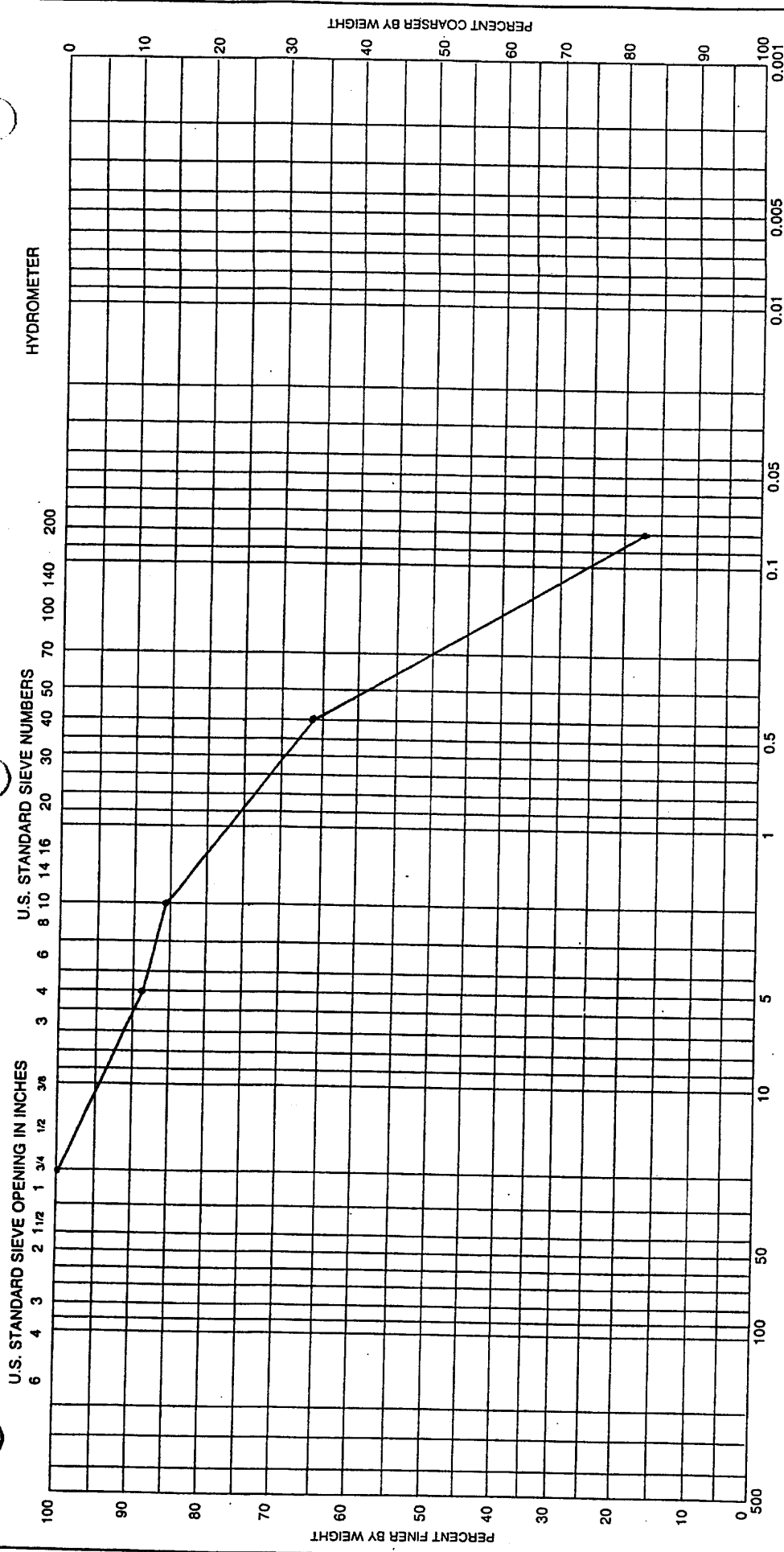
U.S. STANDARD SIEVE OPENING IN INCHES



Sample No.	Elev or Depth	Classification				SAND				SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	NEUTRAL	FINE	PL	PI		
PZ-1 - 27	130'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)				Net w %	LL	PL	PI	Project	Amarillo MSW-LF
										Area	
										Boring No.	PZ-1
										Date	7-30-94

GRADATION CURVES





Sample No.	Elev or Depth	Classification			SAND			PI
		COARSE	FINE	NET W %	LL	PL	NP	
PZ-1 - 29	140'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)						NP

GRADATION CURVES

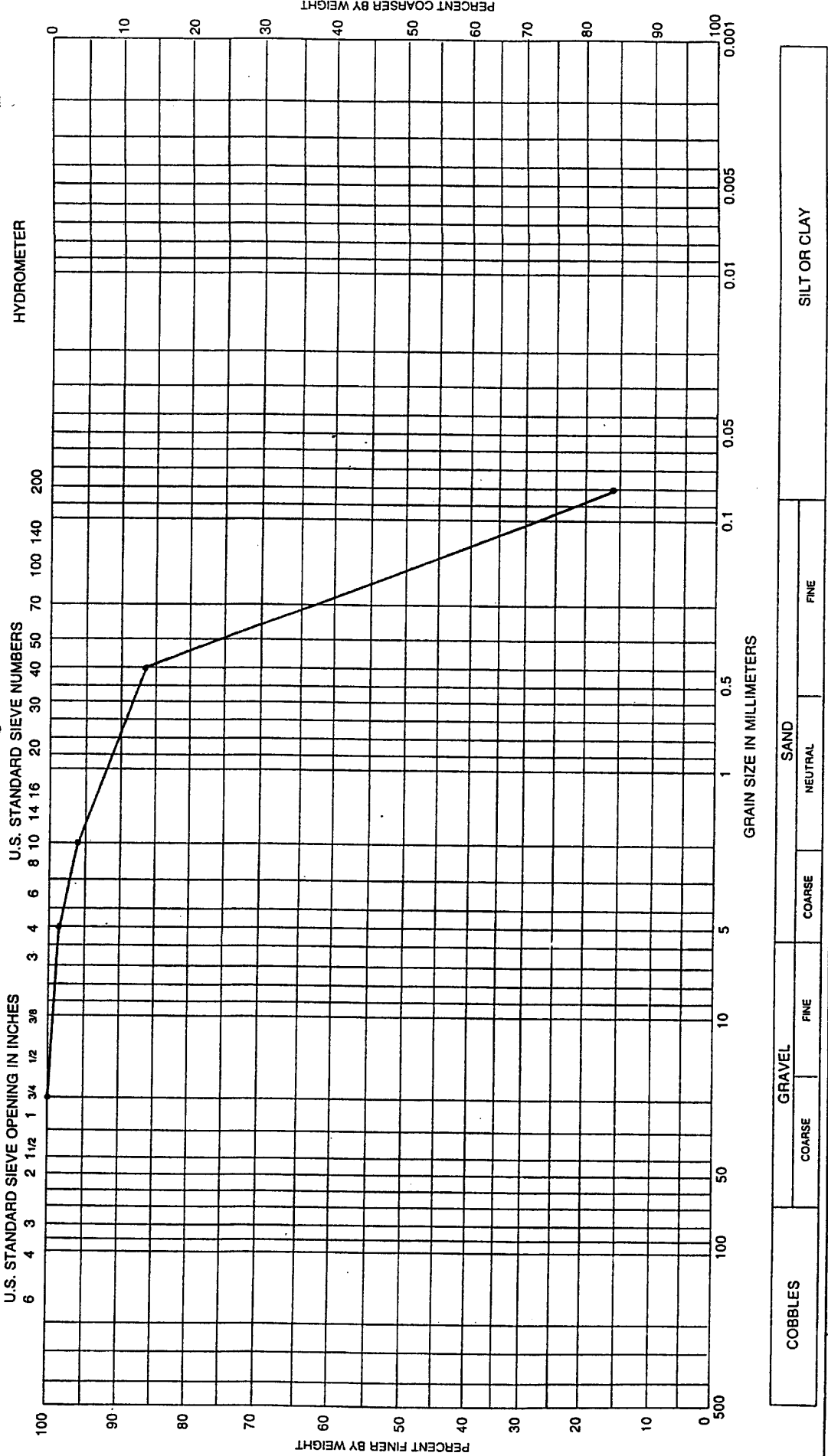
SILT OR CLAY

Project Amarillo MSW-LF

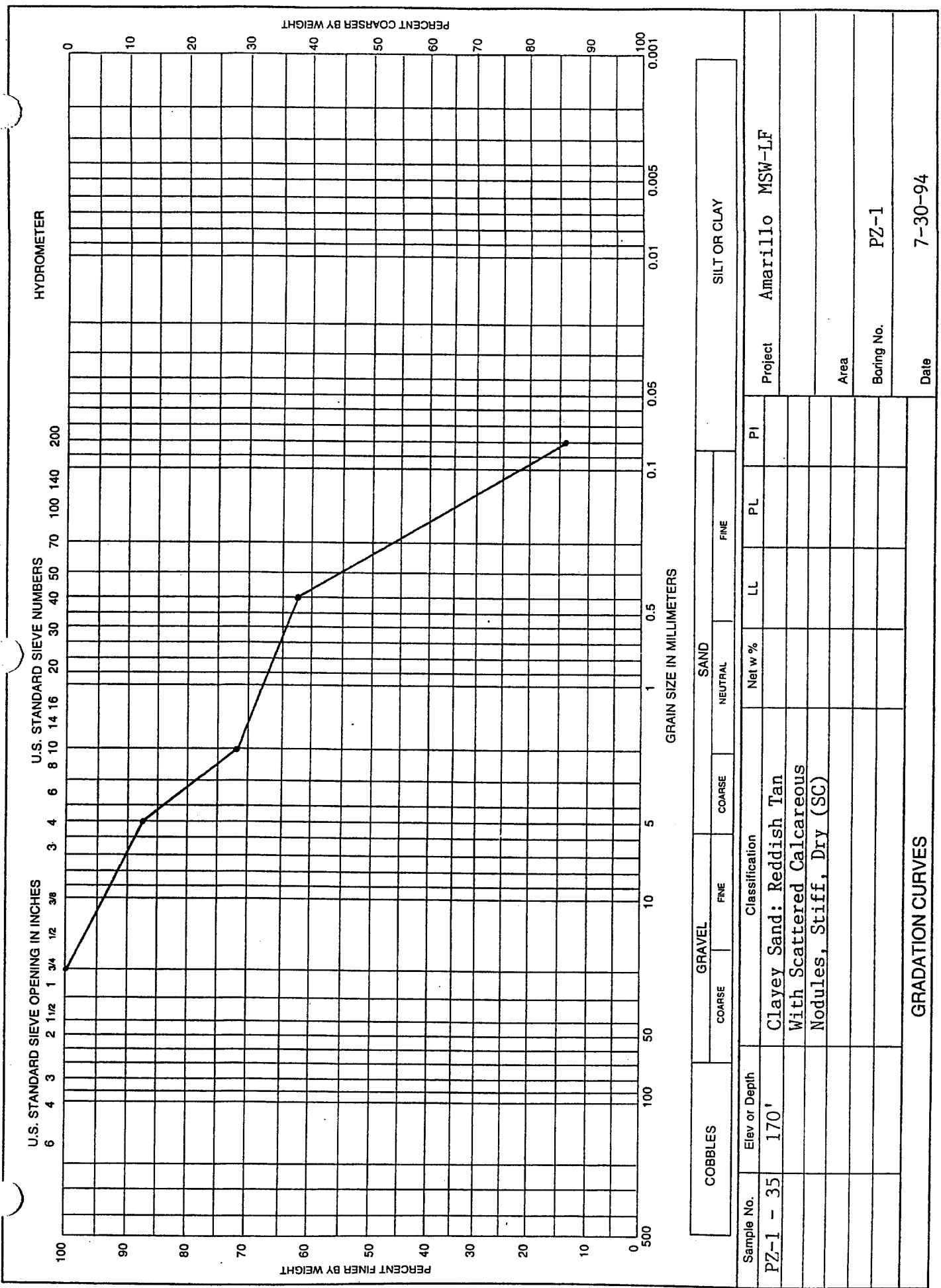
Area

Boring No. PZ-1

Date 7-30-94



COBBLES		GRAVEL		SAND		SILT OR CLAY			
		COARSE	FINE	NEUTRAL	FINE				
Sample No.	Elev or Depth	Classification				Net w %	LL	PL	PI
PZ-1 - 33	160'	Clayey Sand; Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)							NP
GRADATION CURVES									
			Project		Amarillo MSW-LF				
			Area						
			Boring No.		PZ-1				
			Date		7-30-94				



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

PERCENT COARSER BY WEIGHT

PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

COBBLES	GRAVEL		SAND		FINE	SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE		

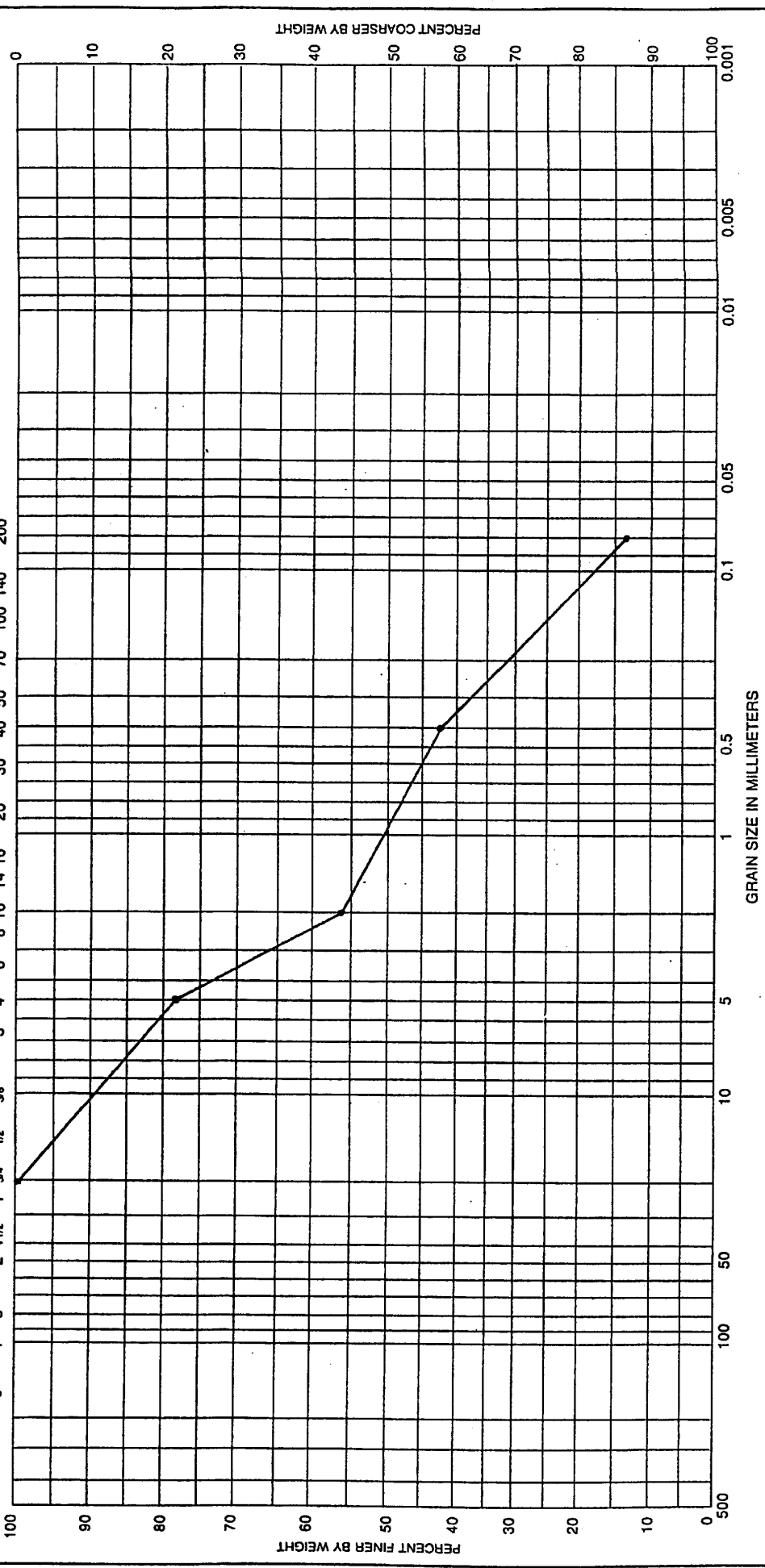
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
PZ-1 - 35	170'	Clayey Sand: Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)					Amarillo MSW-LF
							Area
							Boring No. PZ-1
							Date 7-30-94

GRADATION CURVES

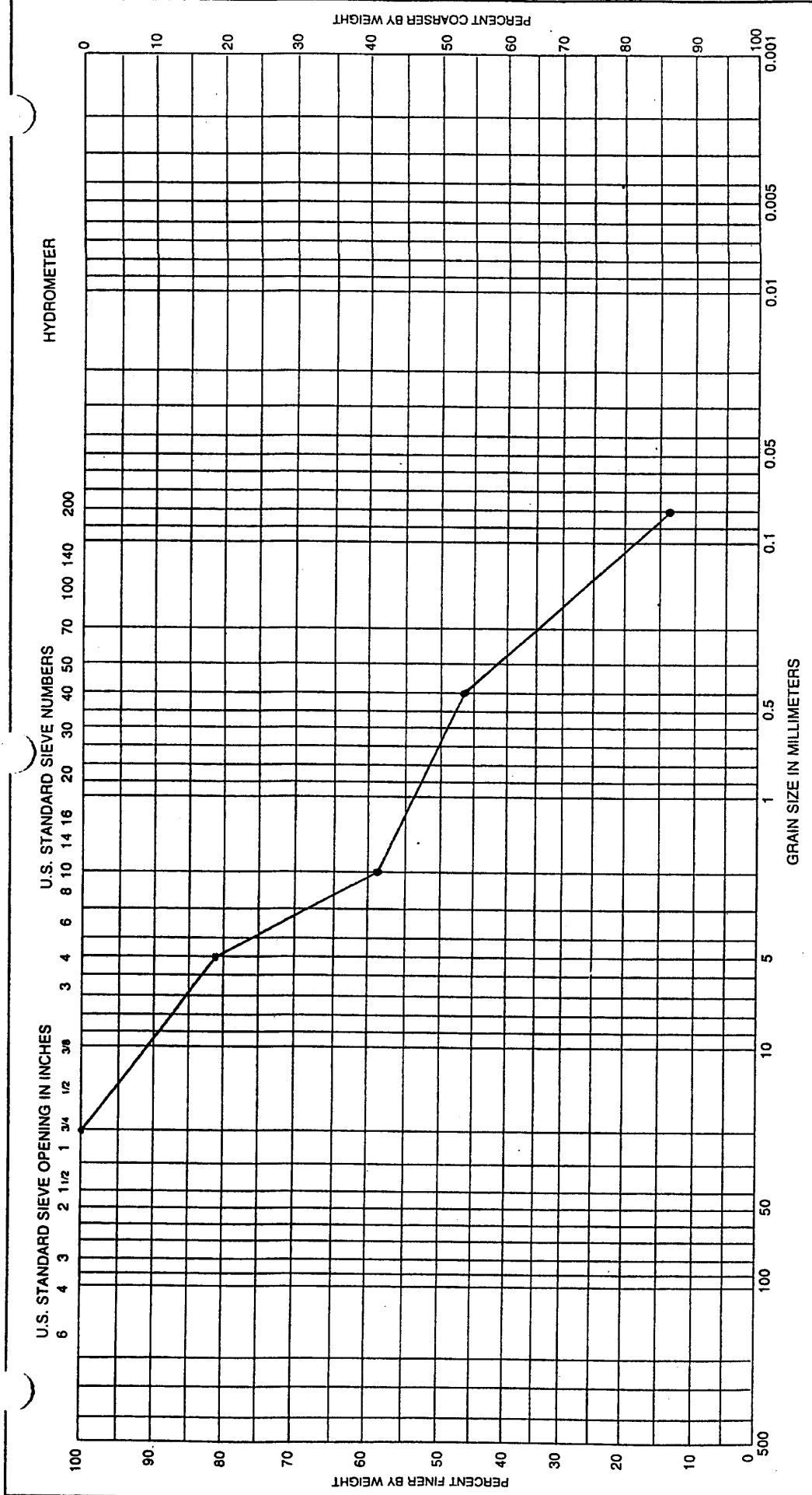
U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



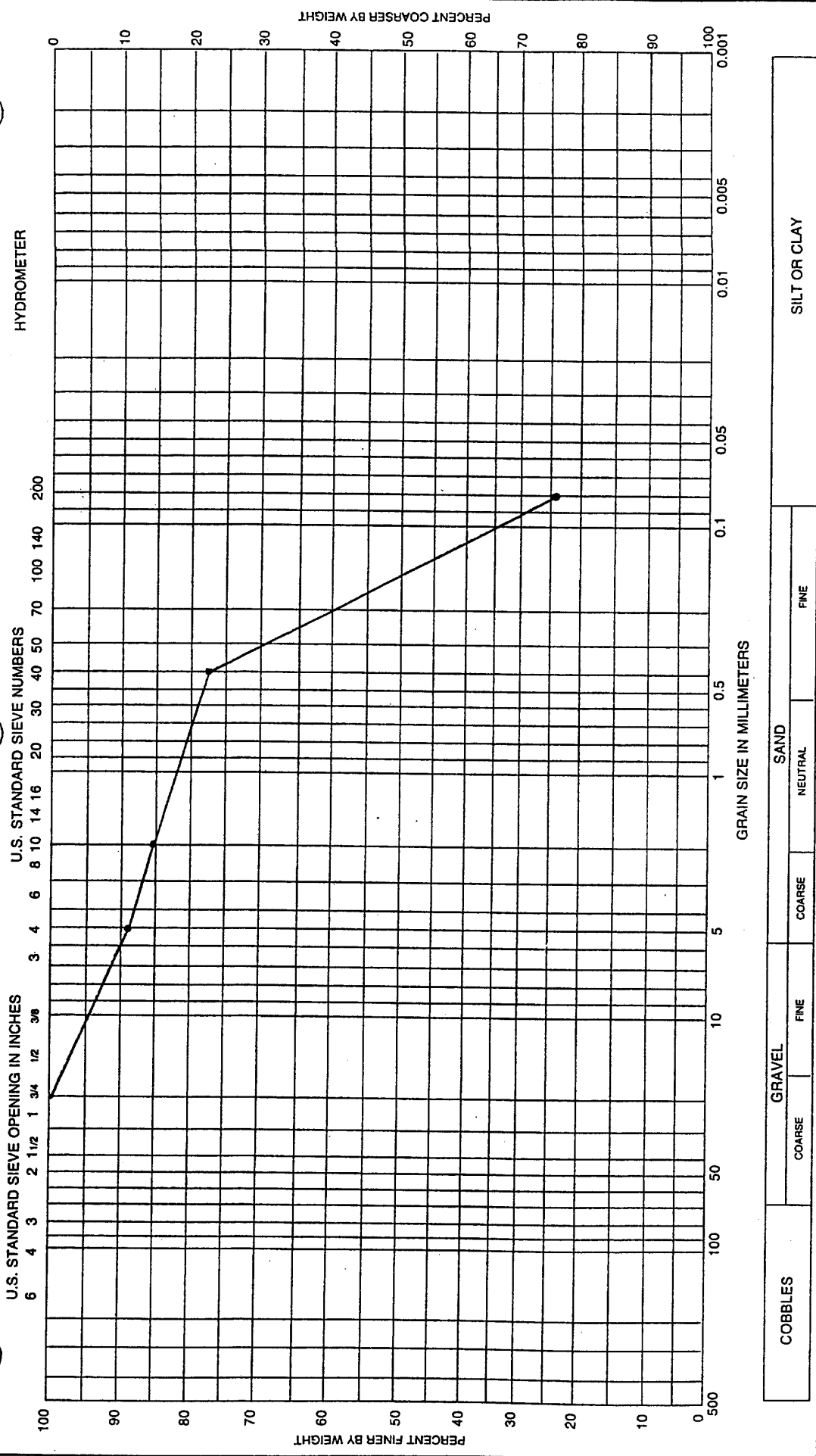
COBBLES		GRAVEL		SAND			SILT OR CLAY		
		COARSE	FINE	COARSE	NEUTRAL	FINE			
Sample No.	Elev or Depth	Classification							
PZ-1 -37	180'	Clayey Sand; Reddish Tan With Scattered Calcareous Nodules, Stiff, Dry (SC)							
				Net w %	LL	PL	PI	Project	
							NP	Amarillo MSW-LF	
								Area	
								Boring No.	
								PZ-1	
								Date	
								7-30-94	
GRADATION CURVES									



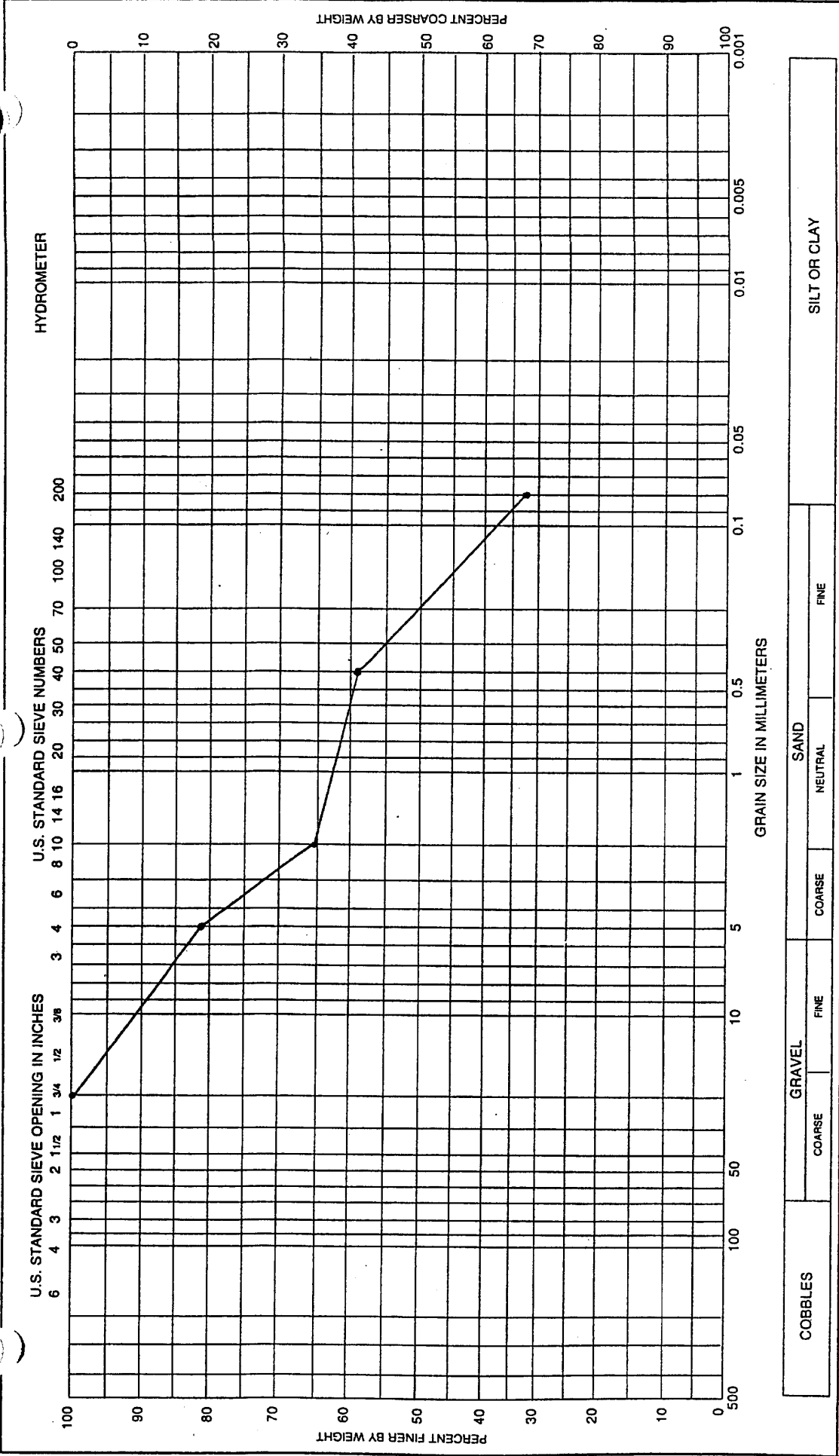
COBBLES		GRAVEL		SAND			SILT OR CLAY		
COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI		
Sample No. Elev or Depth		Classification							
PZ-1 ~ 41 200'		Sand: Tan. Fine Grain w/Small Pea Gravel (GW)						Net w %	
								Project	
								Amarillo MSW-LF	
								Area	
								Boring No.	
								PZ-1	
								Date	
								7-30-94	

**GRADATION CURVES**





Sample No.	Elev or Depth	Classification				Net w %	LL	PL	PI	Project	Area	Boring No.	Date
		COARSE	FINE	NEUTRAL	FINE								
PZ-1 - 45	220'	Clayey Sand: Tan w/Scattered Calcareous Nodules (CL)							NP	Amarillo	MSW-LF	PZ-1	7-30-94
GRADATION CURVES													



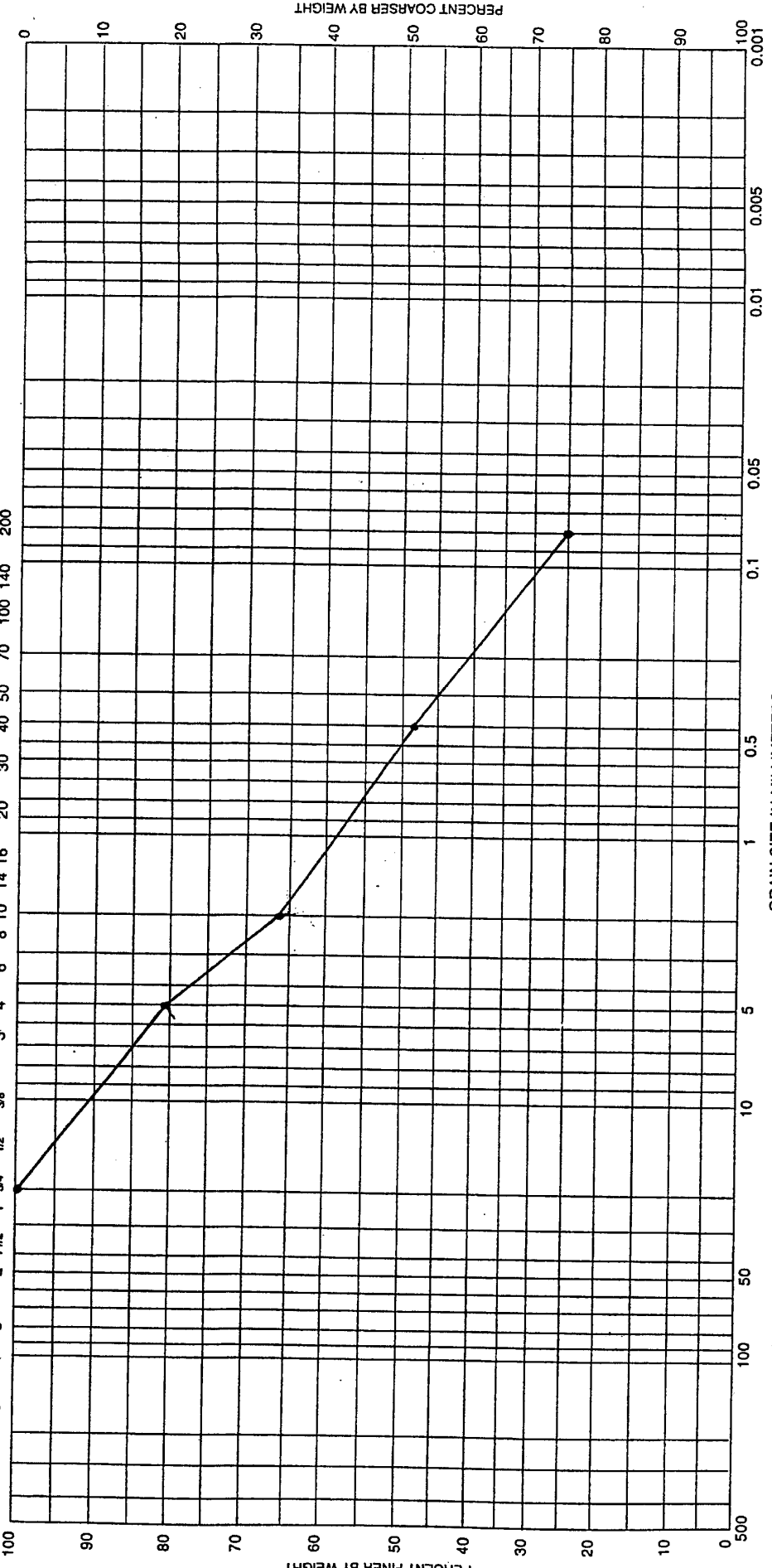
COBBLES Sample No. PZ-1 - 47	Elev or Depth 230'	GRAVEL COARSE      FINE				SAND COARSE      NEUTRAL      FINE				SILT OR CLAY			
		Classification Clayey Sand: Tan With Scattered Calcareous Nodules (SC)											
Net w %		LL		PL		PI		Project Amarillo MSW-LF		Area PZ-1			
GRADATION CURVES		Boring No. PZ-1		Date 7-30-94									



U.S. STANDARD SIEVE OPENING IN INCHES  
6 4 3 2 1 1/2 1 3/4 1/2 3/8

U.S. STANDARD SIEVE NUMBERS  
6 8 10 14 16 20 30 40 50 70 100 140 200

HYDROMETER



PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

Sample No.	Elev or Depth	Classification	SOIL			Project
			COARSE	NEUTRAL	FINE	
PZ-1-49	240'	Clayey Sand: Tan With Scattered Calcareous Nodules (SC)				Amarillo MSWLF
						Area
						Boring No.
						Date

COBBLES

GRAVEL

COARSE

FINE

SAND

NEUTRAL

FINE

SILT OR CLAY

GRADATION CURVES

7-30-94

LOG OF BORING

PZ - 2

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-2  
 LOCATION: Amarillo, Texas

Date: 7-27-94 thru 7-30-94

Ground Elevation: 3793.86'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE	
			GROUNDWATER INFORMATION: Air Drilled to 195' Mud Drilled to 235'										
DESCRIPTION OF STRATUM													
0			Sandy Clay: Brown										
			Sandy Clay: Reddish Brown										
5		⊗	Sandy Clay: Reddish Tan with Scattered Calcareous Nodules(CL)		41-6"	8.7		31	15	16	2.75	93.1	
					50-6.6"								
10		⊗	K = 6.72 X 10 <sup>-6</sup> cm/sec		21-6"	9.0		28	13	15		87.2	
					38-12"								
					50-15"								
15		⊗			31-6"	8.1		34	14	20		86.0	
					50-7.5"								
20		⊗			50-6"	7.6		37	15	22	2.50	87.3	
25		⊗			20-6"	7.8		34	20	14	2.0	87.9	
					50-12"								
30													

Continued on Page 2

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-2  
 LOCATION: Amarillo, Texas

Date: 7-27-94 thru 7-30-94

Ground Elevation: 3793.86'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 195' Mud Drilled to 235'									
			DESCRIPTION OF STRATUM									
30	X		Sandy Clay: Reddish Tan with Scattered Calcareous Nodules (CL) K = 9.21 X 10 <sup>-6</sup> cm/sec		50-6"	7.2		30	18	12		79.2
35	X				50-6"	6.3		33	16	17	3.0	81.6
40	X		Sandy Clay: Reddish Tan with Scattered Calcareous Nodules, Stiff, Dry (CL)		50-5"	7.8		32	20	12		78.4
45	X				39-6"	7.1		33	18	15		75.4
					50-6.5"							
50	X				50-6"	6.7		30	18	12		77.8
55	X				50-3"						4.0+	
			Caliche: Light Tan Limestone Layers, Fractures, Hard (CL)									
60			Continued on Page 3									

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-2  
 LOCATION: Amarillo, Texas

Date: 7-27-94 thru 7-30-94

Ground Elevation: 3793.86'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary																	
			GROUNDWATER INFORMATION: Air Drilled to 195' Mud Drilled to 235'																	
			DESCRIPTION OF STRATUM																	
			SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE										
60		X	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Stiff, Dry (SC)																	
													50-4"	5.2						33.1
65		X											41-6"	6.3		24	18	6		52.9
													50-6.5"							
70		X	50-4"	5.7		27	17	10	4.0+	43.6										
75		X	50-6"	4.9		25	16	9	3.0	33.7										
80		X	50-5"	4.3		23	19	4	4.0	29.1										
85		X	50-5"	3.9		25	17	8		29.5										
90																				

$K = 3.75 \times 10^{-5} \text{ cm/sec}$

Continued on Page 4

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-2  
 LOCATION: Amarillo, Texas

Date: 7-27-94 thru 7-30-94

Ground Elevation: 3793.86'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 195' Mud Drilled to 235'									
			DESCRIPTION OF STRATUM									
90	○	X	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules(SC)									
					50-7"							
95	○	X										
					50-7"							
100	○	X										
105	○	X										
110	○	X										
115	○	X										
120	○	X										

Continued on Page 5

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-2  
 LOCATION: Amarillo, Texas

Date: 7-27-94 thru 7-30-94

Ground Elevation: 3793.86'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE												
			GROUNDWATER INFORMATION: Air Drilled to 195' Mud Drilled to 235'																					
			DESCRIPTION OF STRATUM																					
120	(Symbol: Diagonal lines with circles)	X											40-6"	4.4					2.75	25.1				
													50-7"											
125	(Symbol: Diagonal lines with circles)	X																						
130	(Symbol: Diagonal lines with circles)	X	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules, Stiff, Dry (SC)										50-6"	3.1		22	19	3	3.0	19.9				
135	(Symbol: Diagonal lines with circles)	X																						
140	(Symbol: Diagonal lines with circles)	X											50-5"	3.8		19	16	3		19.0				
145	(Symbol: Diagonal lines with circles)	X																						
150	(Symbol: Diagonal lines with circles)	X																						

Continued on Page 6

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-2  
 LOCATION: Amarillo, Texas

Date: 7-27-94 thru 7-30-94

Ground Elevation: 3793.86'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE		
			GROUNDWATER INFORMATION: Air Drilled to 195' Mud Drilled to 235'										
			DESCRIPTION OF STRATUM										
150	(Symbol: Diagonal lines with circles)	X	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules(SC)	50-6"	3.2						15.0		
155	(Symbol: Diagonal lines with circles)												
160	(Symbol: Diagonal lines with circles)	X			31-6" 50-8"	2.7		18	16	2		16.6	
165	(Symbol: Diagonal lines with circles)												
170	(Symbol: Diagonal lines with circles)	X			50-3"	3.8							
175	(Symbol: Diagonal lines with circles)												
180	(Symbol: Diagonal lines with circles)												

Continued on Page 7



## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-2  
 LOCATION: Amarillo, Texas

Date: 7-27-94 thru 7-30-94

Ground Elevation: 3793.86'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 195' Mud Drilled to 235'									
180	○	X	Sand: Tan, Fine Grain with Scattered Calcareous Nodules (SC)		50-4"					NP		13.0
185	○											
190	○	X	Sand: Tan with Small Pea Gravel (GW)		50-3"	MD						12.2
195	○											
200	○	X	Sand: Tan, Fine Grain with Scattered Calcareous Nodules (SC)		50-5"	MD						14.6
205	○											
210	○											

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-2  
 LOCATION: Amarillo, Texas

Date: 7-27-94 thru 7-30-94

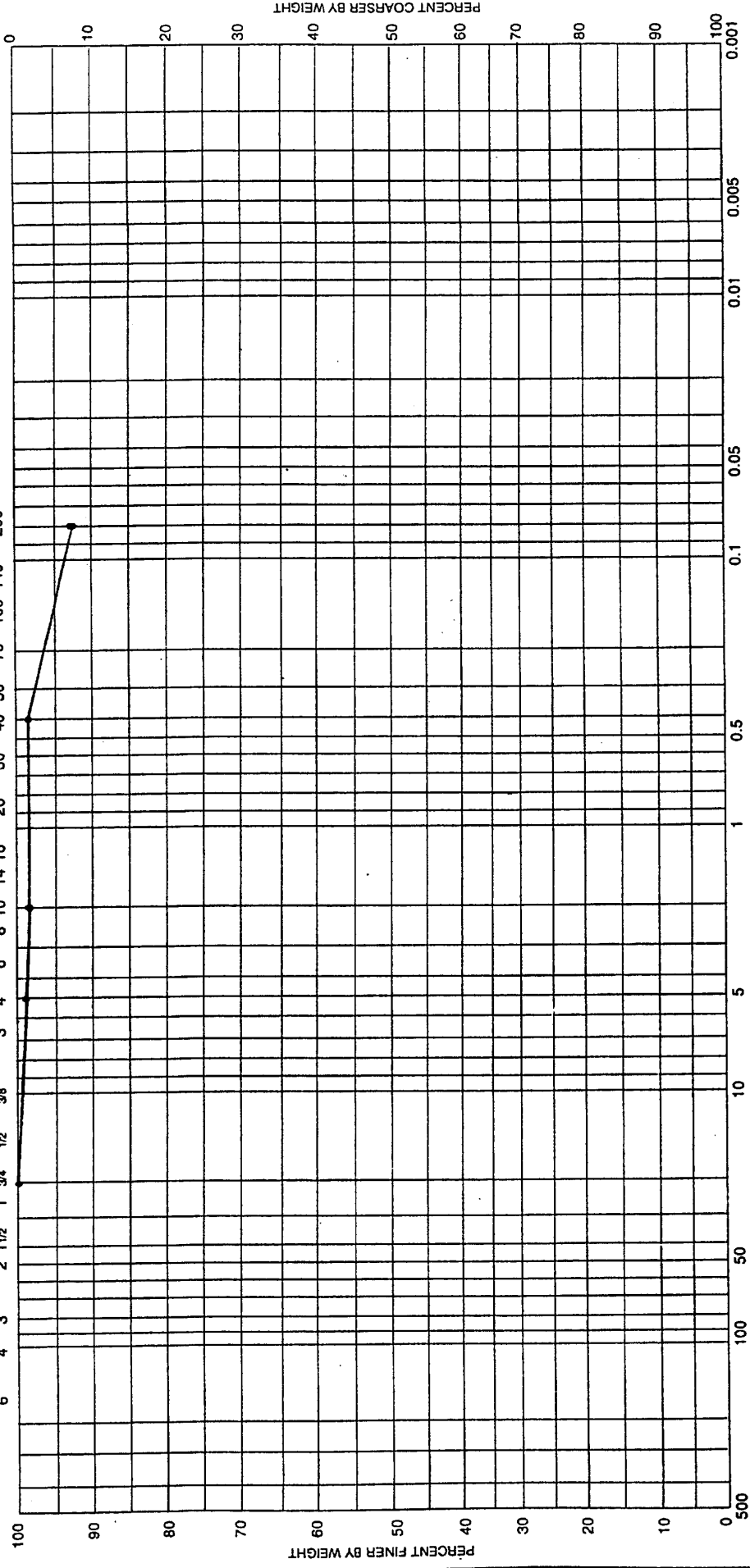
Ground Elevation: 3793.86'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE	
			GROUNDWATER INFORMATION: Air Drilled to 195' Mud Drilled to 235'										DESCRIPTION OF STRATUM
210	/ / / / /		Sand: Tan, Fine Grain with Scattered Calcareous Nodules (SC)		50-3"	MD				NP			
215	/ / / / /												
220	/ / / / /												
225	/ / / / /												
230	/ / / / /												
235	/ / / / /												
			* T.D. - 235' *										

U.S. STANDARD SIEVE OPENING IN INCHES  
 6 4 3 2 1 1/2 1 3/4 1/2 3/8

U.S. STANDARD SIEVE NUMBERS  
 10 20 30 40 50 60 70 100 140 200

HYDROMETER

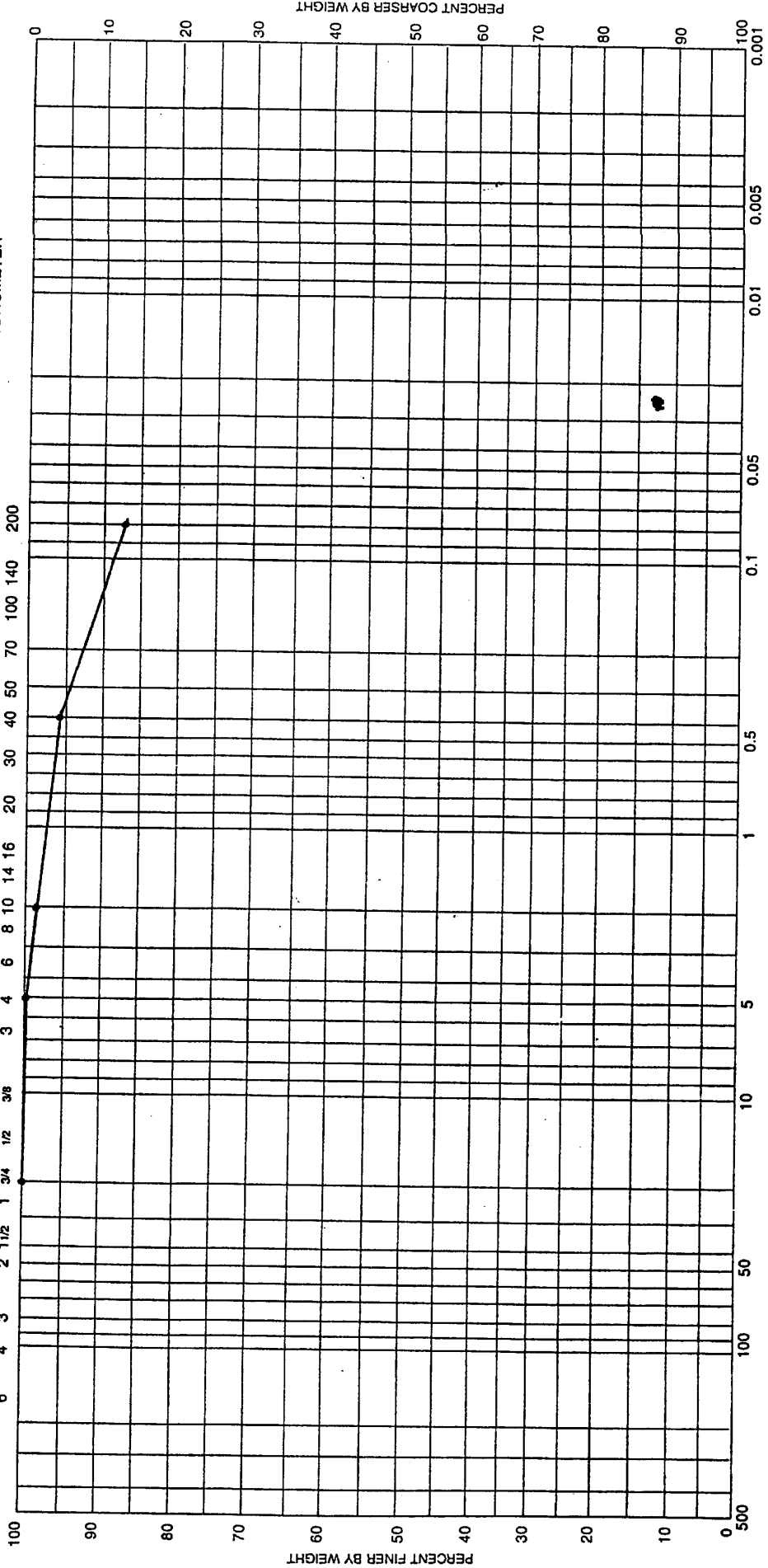


COBBLES	GRAVEL			SAND				SILT OR CLAY		
		COARSE	FINE		NEUTRAL	FINE				
Sample No. PZ-2 - 1	Classification Sandy Clay: Reddish Tan w/Scattered Calcareous Nodules (CL)				Net w %	LL	PL	PI		
Elev or Depth 5'					31	15	16			
Project Amarillo MSWLF										
Area										
Boring No. PZ-2										
Date 7-27-94										
GRADATION CURVES										

U.S. STANDARD SIEVE OPENING IN INCHES  
 6 4 3 2 1 1/2 1 3/4 1/2 3/8

U.S. STANDARD SIEVE NUMBERS  
 3 4 6 8 10 14 16 20 30 40 50 70 100 140 200

HYDROMETER

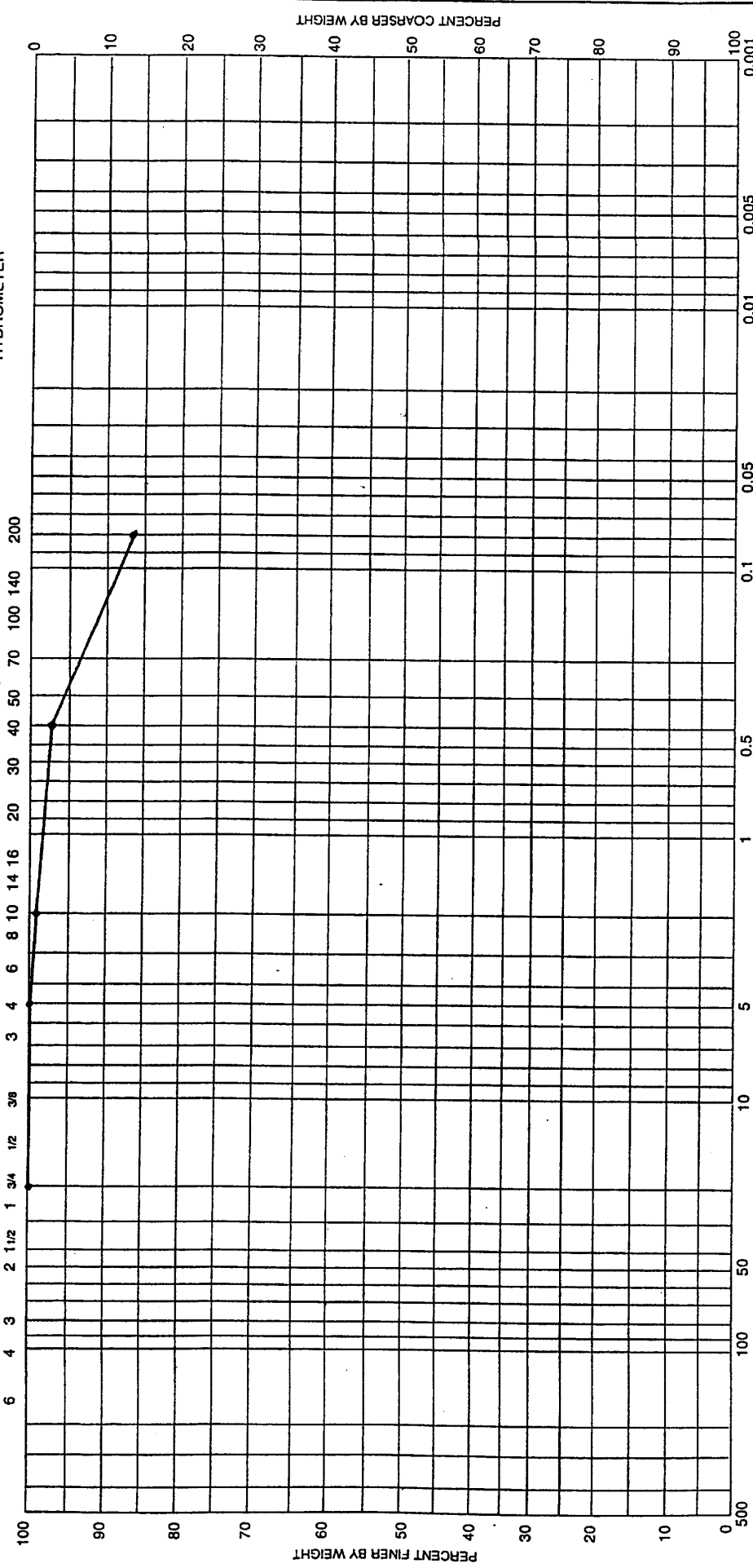


<b>GRAVEL</b>		<b>SAND</b>		<b>SILT OR CLAY</b>	
	COARSE	FINE	NEUTRAL	FINE	
Sample No.	Classification				PI
PZ-2 - 2	Sandy Clay: Reddish Tan w/Scattered Calcareous Nodules (CL)				13
Elev or Depth	Net w %				LL
10'	28				PI
					15
<b>GRADATION CURVES</b>					
Project		Amarillo MSWLF			
Area					
Boring No.		PZ-2			
Date		7-27-94			

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



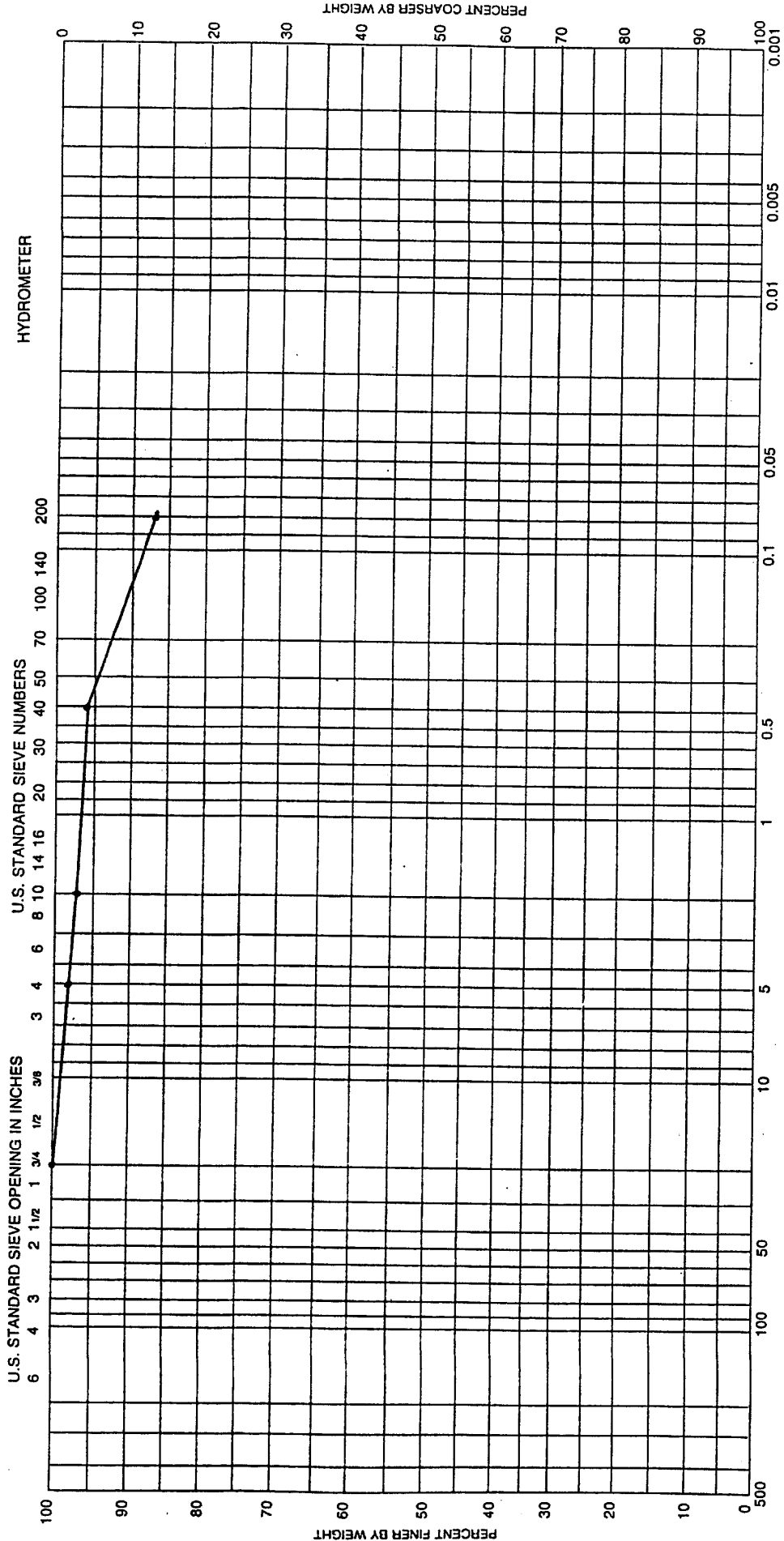
PERCENT FINER BY WEIGHT

PERCENT COARSER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

Sample No.	Elev or Depth	Classification	SAND				SILT OR CLAY	
			COARSE	FINE	NEUTRAL	FINE	PI	PL
PZ-2 - 3	15'	Sandy Clay: Reddish Tan with Scattered Calcareous Nodules (CL)	Net w %	LL	PL	PI	Project	Amarillo MSWLF
			34	34	14	20	Area	
							Boring No.	PZ-2
							Date	7-27-94

GRADATION CURVES



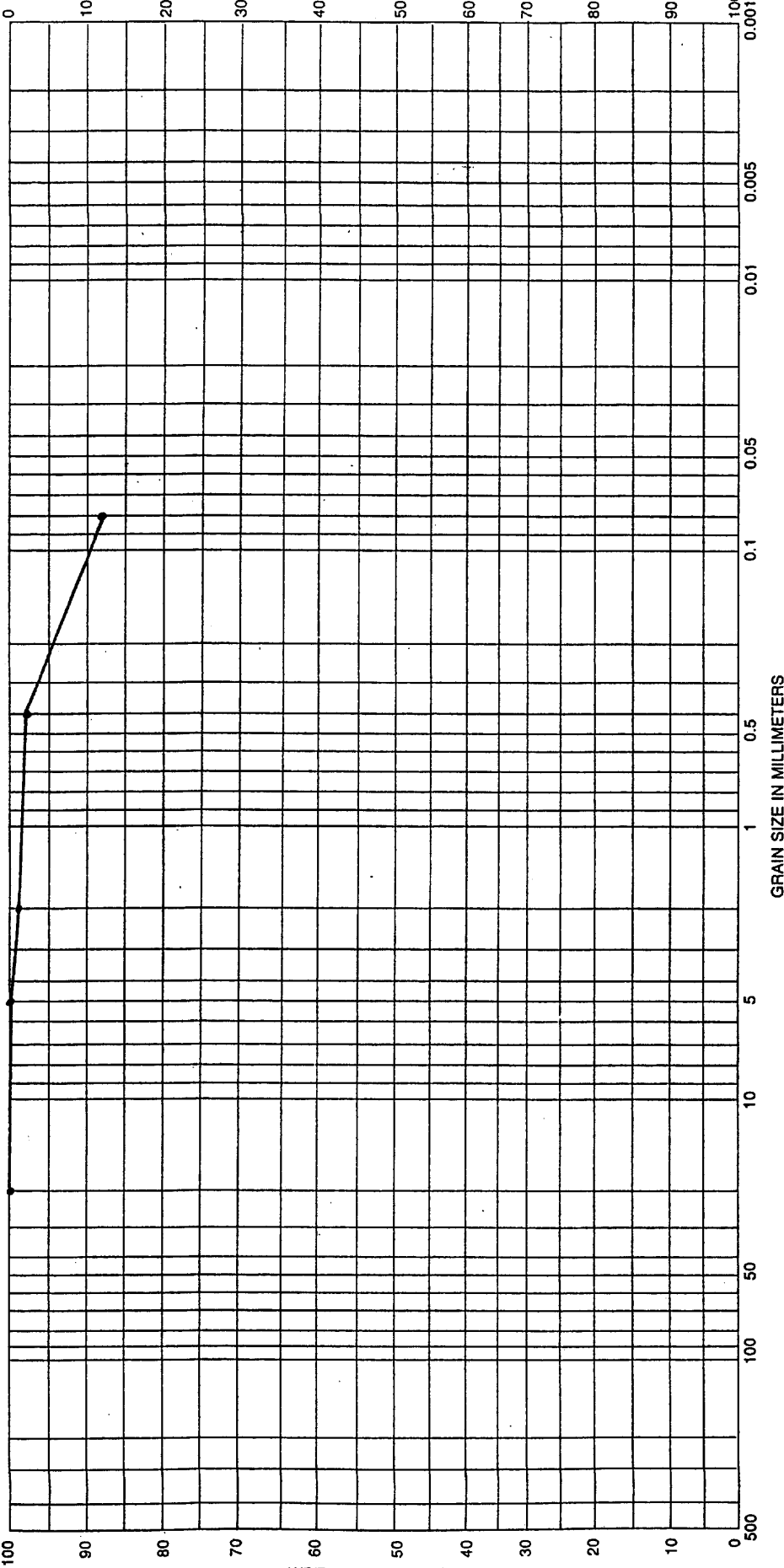
COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	FINE	
Sample No.	Elev or Depth	Classification					
PZ-2 - 4	20'	Sandy Clay: Reddish Tan with Scattered Calcareous Nodules (CL)					
		Net w %	LL	PL	PI		
		37	15	22			
		Area					
		Boring No. PZ-2	Project Amarillo MSWLF				
		Date	7-27-94				
GRADATION CURVES							

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

PERCENT COARSER BY WEIGHT



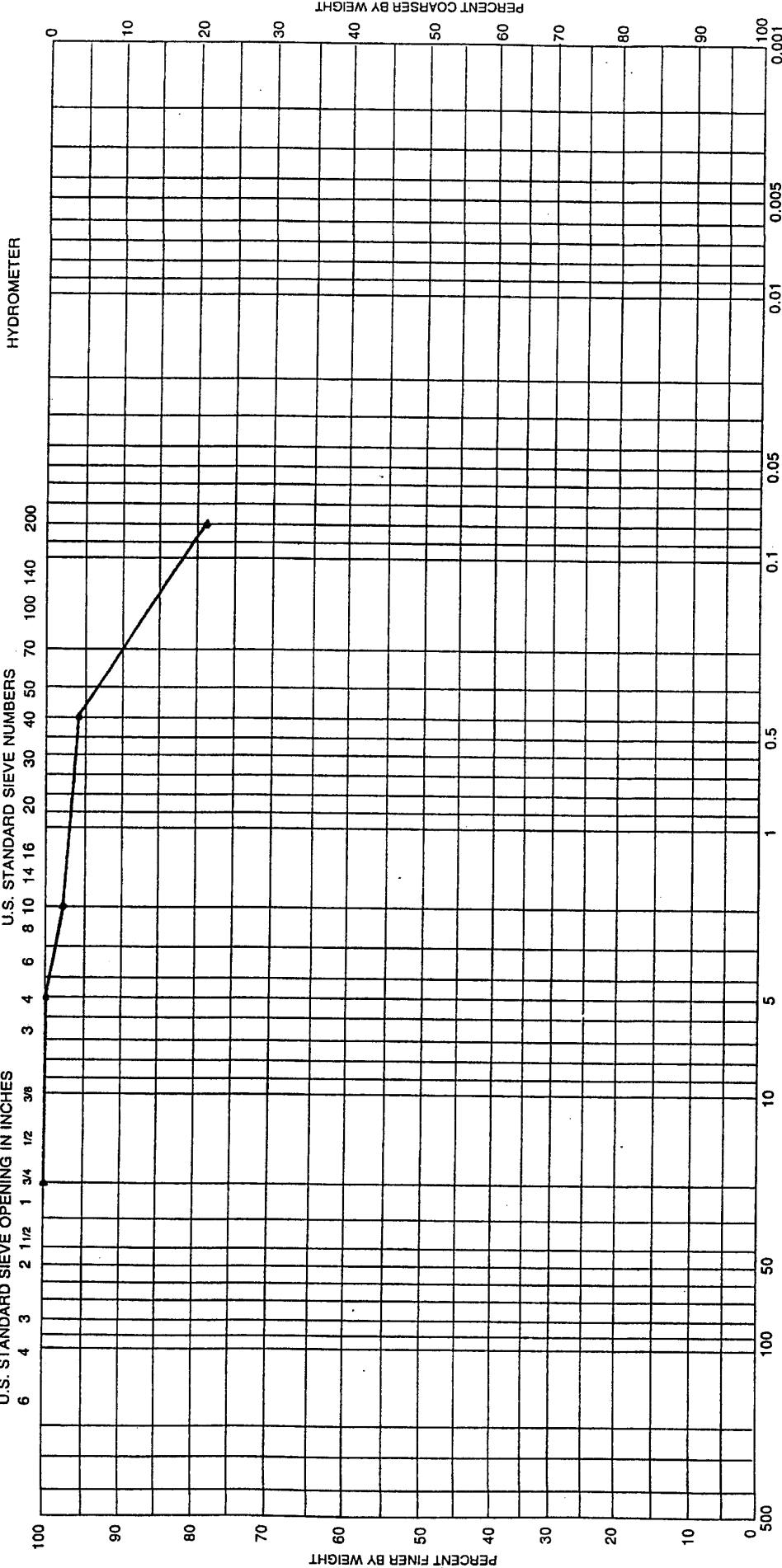
PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

Sample No.	Elev or Depth	GRAVEL			SAND			SILT OR CLAY		
		COARSE	FINE		NEUTRAL		FINE			
		Classification								
		Net w %								
		PL			LL			PI		
PZ-2 - 5	25'	Sandy Clay; Reddish Tan with Scattered Calcareous Nodules (CL)								
		20			34			14		
		Area								
		Boring No. PZ-2								
		Date 7-27-94								
GRADATION CURVES										
Project Amarillo MSWLF										

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



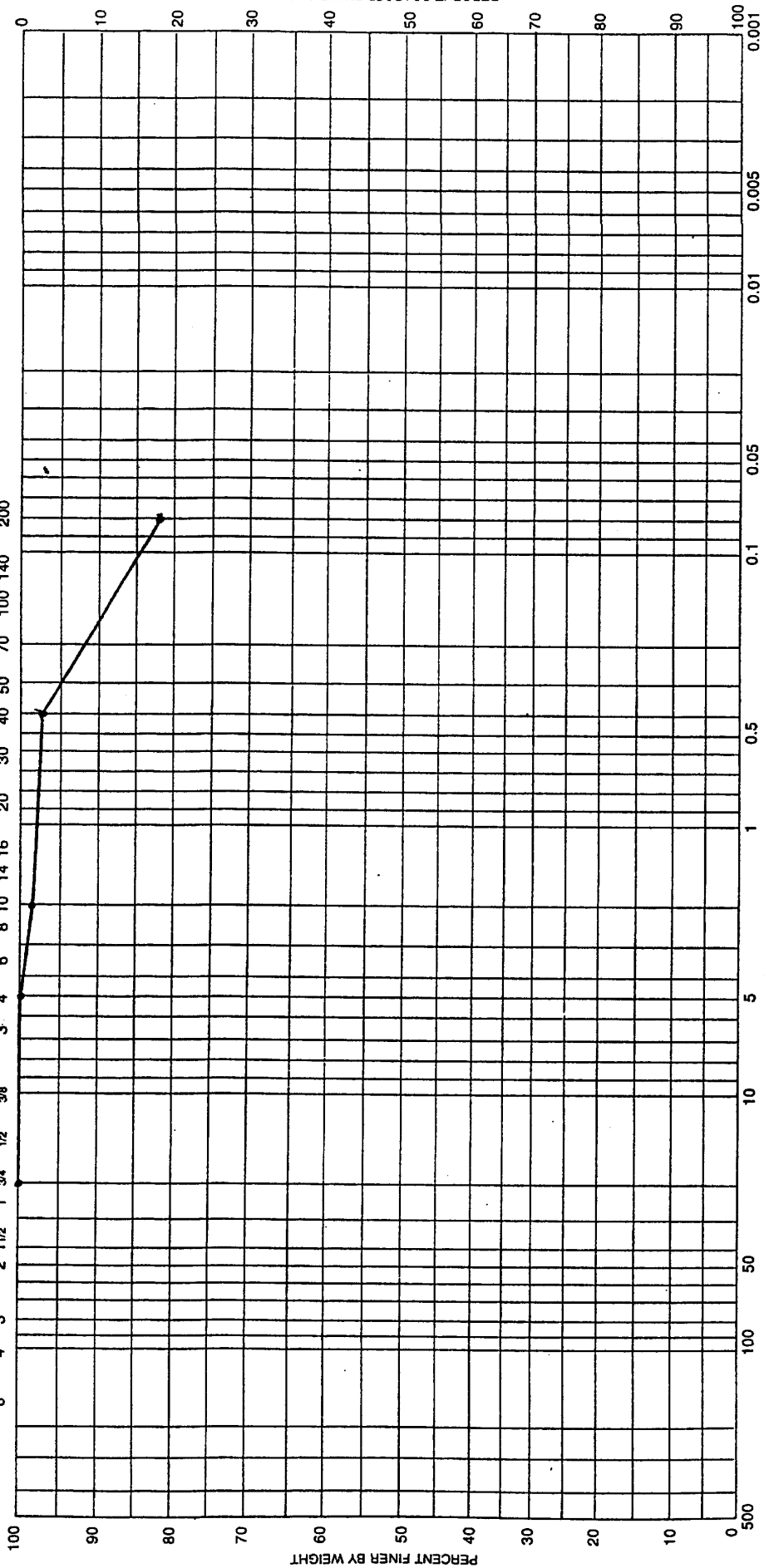
Sample No.	Elev or Depth	Classification			SAND			SILT OR CLAY		
		COARSE	FINE	NETRAL	Net w %	LL	PL	PI	Area	Boring No.
PZ-2 - 6	30'	Sandy Clay: Reddish Tan with Scattered Calcareous Nodules (CL)			30	18	12	Project Amarillo MSWLF		
								Boring No. PZ-2		
								Date 7-27-94		
GRADATION CURVES										



U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



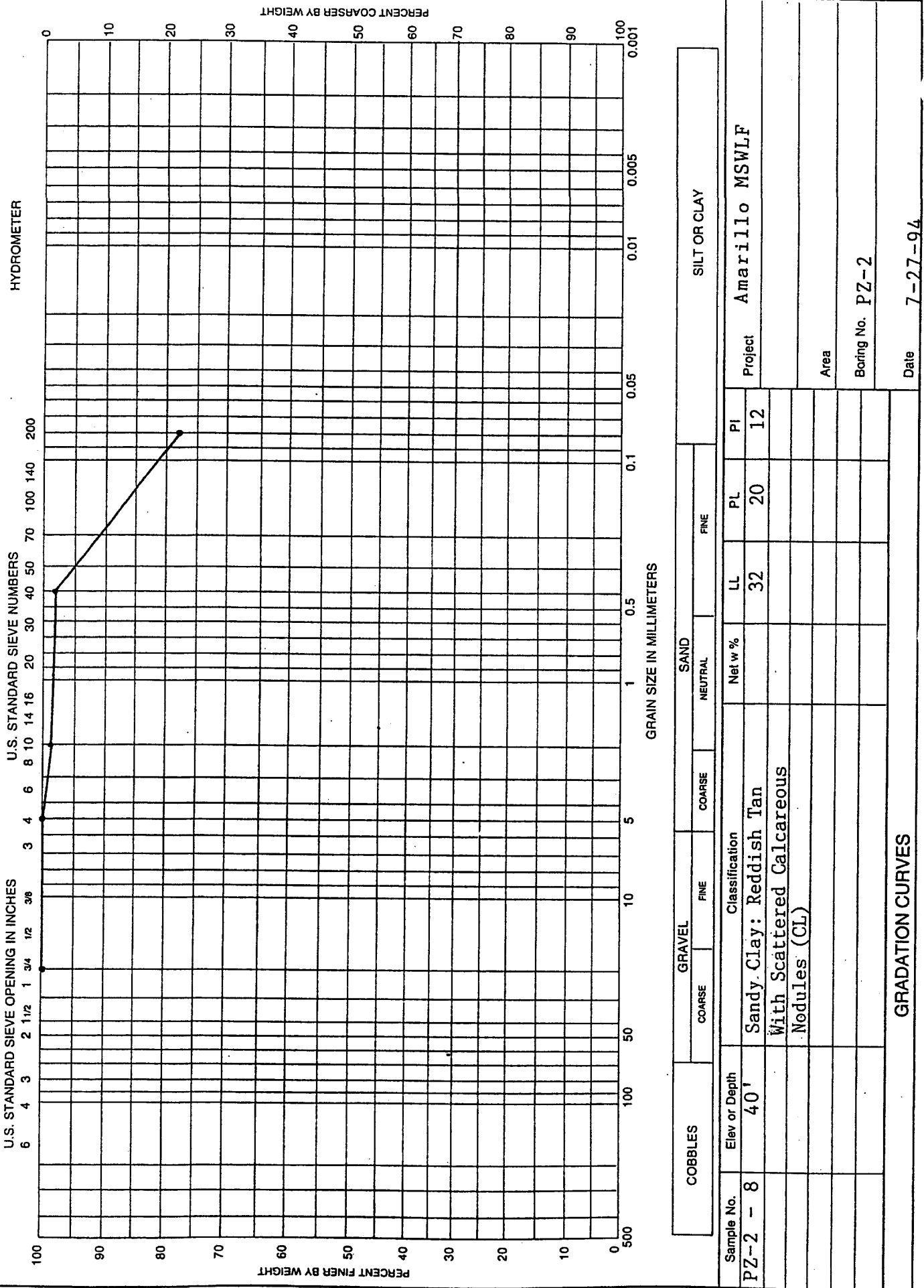
PERCENT COARSER BY WEIGHT

PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

COBBLES		GRAVEL			SAND			SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	FINE			

Sample No.	Elev or Depth	Classification		Net w %	LL	PL	PI	Project	Amarillo MSWLF
PZ-2 - 7	35'	Sandy Clay: Reddish Tan with Scattered Calcareous Nodules (CL)			33	16	17	Area	
								Boring No.	PZ-2
								Date	7-27-94
GRADATION CURVES									

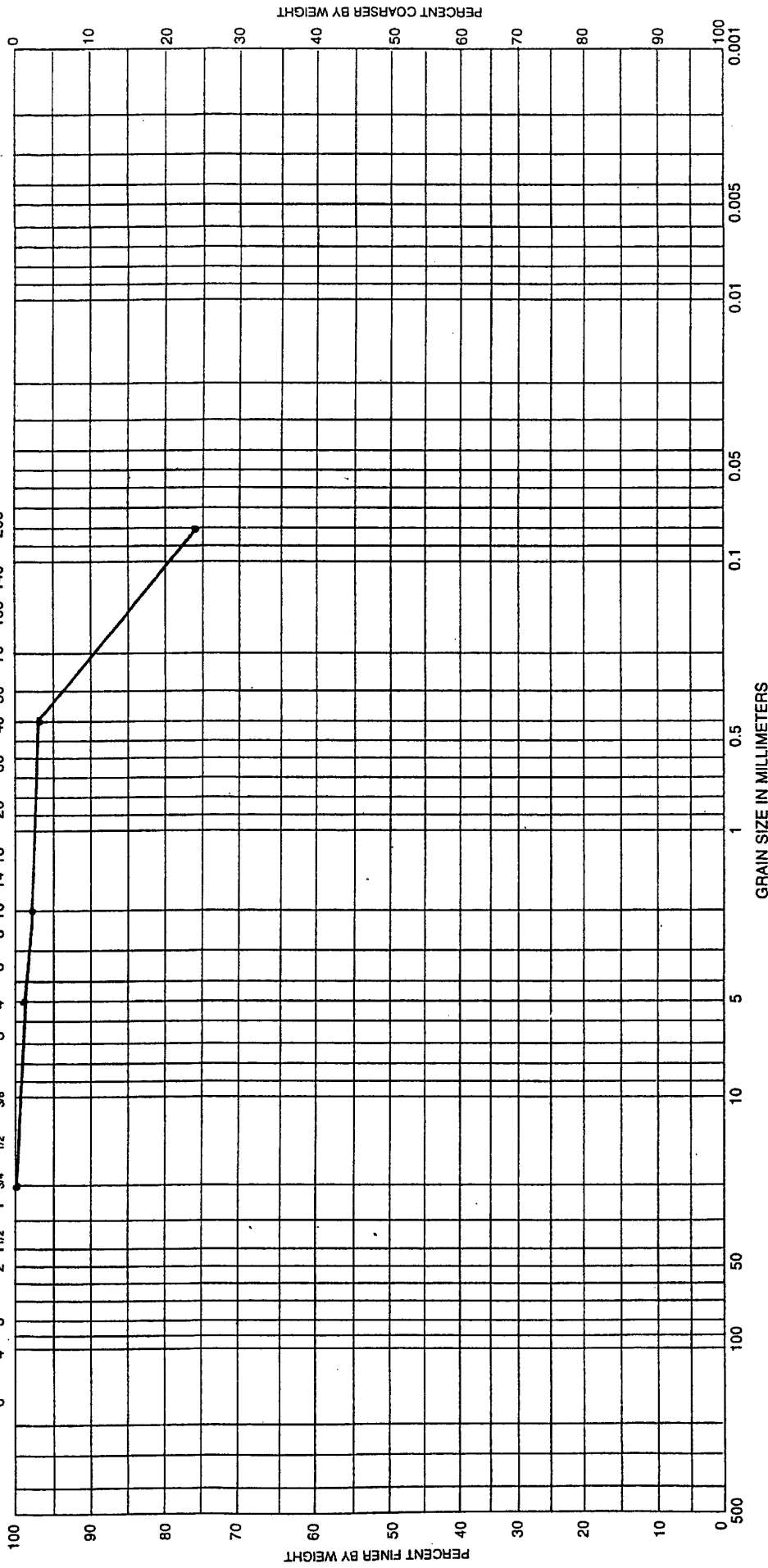


Sample No.	Elev or Depth	Classification	SAND			SILT OR CLAY	
			Net w %	LL	PL	PI	
PZ-2 - 8	40'	Sandy Clay: Reddish Tan With Scattered Calcareous Nodules (CL)		32	20	12	
GRADATION CURVES			Area	Boring No. PZ-2			
				Date 7-27-94			
				Project Amarillo MSWLF			

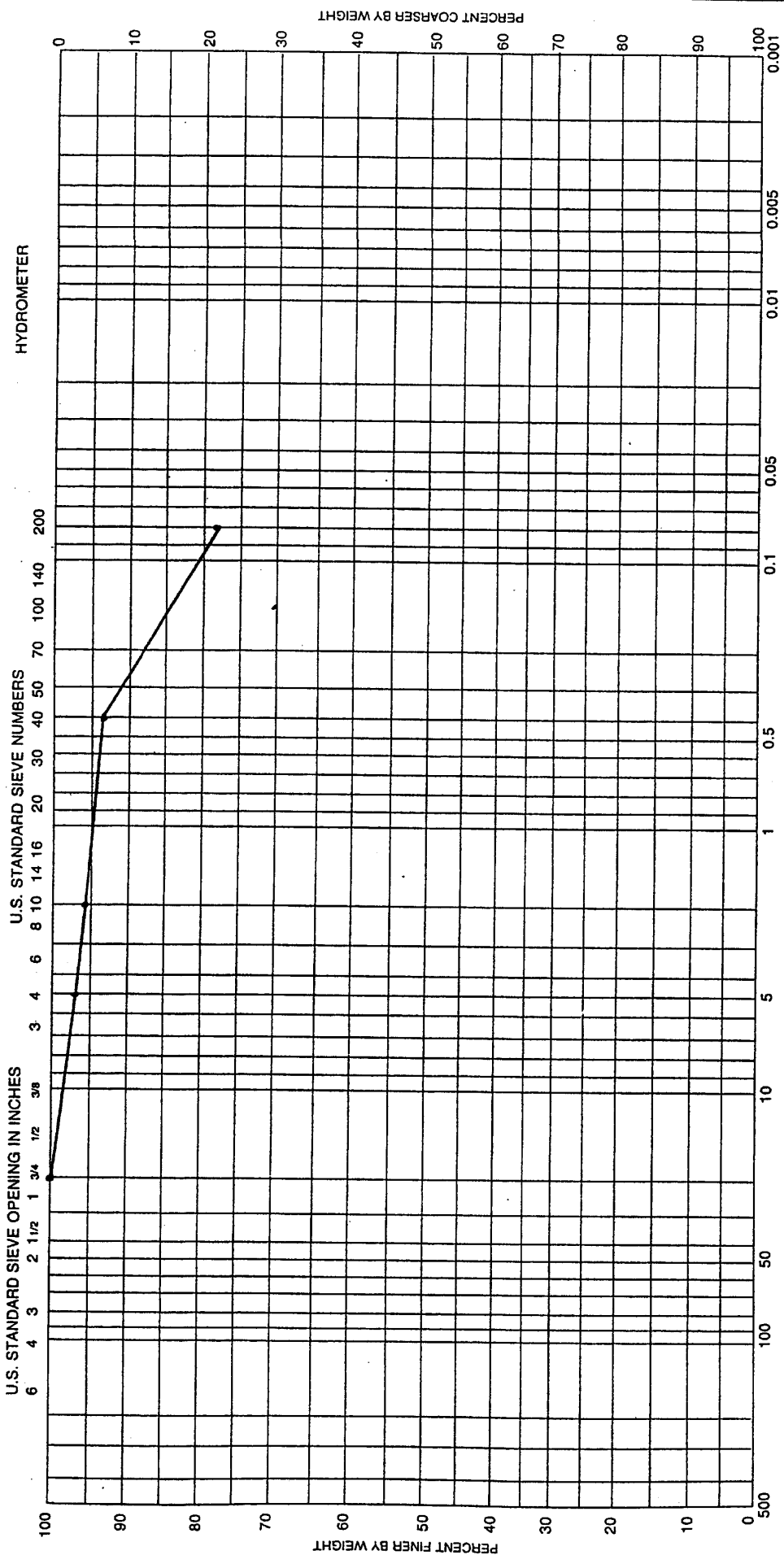
U.S. STANDARD SIEVE OPENING IN INCHES

HYDROMETER

U.S. STANDARD SIEVE NUMBERS



COBBLES		GRAVEL		SAND				SILT OR CLAY				
		COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI			
Sample No.	Elev or Depth	Classification				Net w %	LL	PL	PI	Project		
PZ-2 - 9	45'	Sandy Clay : Reddish Tan with Scattered Calcareous Nodules, Stiff, Dry (CL)					33	18	15	Amarillo MSWLF		
										Area		
										Boring No. PZ-2		
										Date 7-27-94		
GRADATION CURVES												

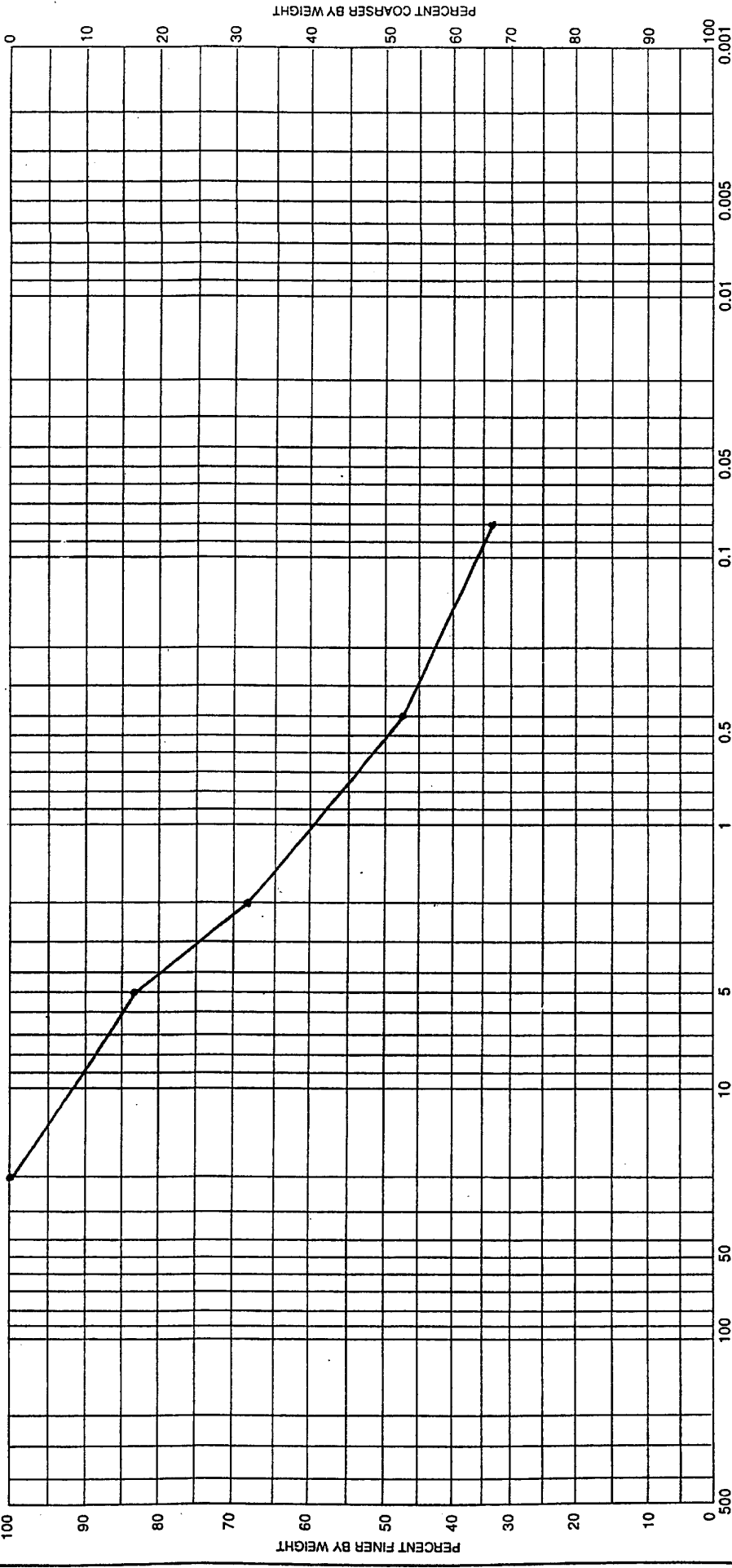


COBBLES		GRAVEL		SAND			SILT OR CLAY		
	COARSE	FINE	COARSE	NEUTRAL	FINE				
Sample No.	Project Amarillo MSWLF								
Elev or Depth	Area								
	Boring No. PZ-2								
	Date 7-27-94								
	Classification								
	Caliche: Light Tan Limestone								
	Layers, Fractures, Hard (CL)								
	Net w %								
	LL 30								
	PL 18								
	PI 12								
GRADATION CURVES									

HYDROMETER

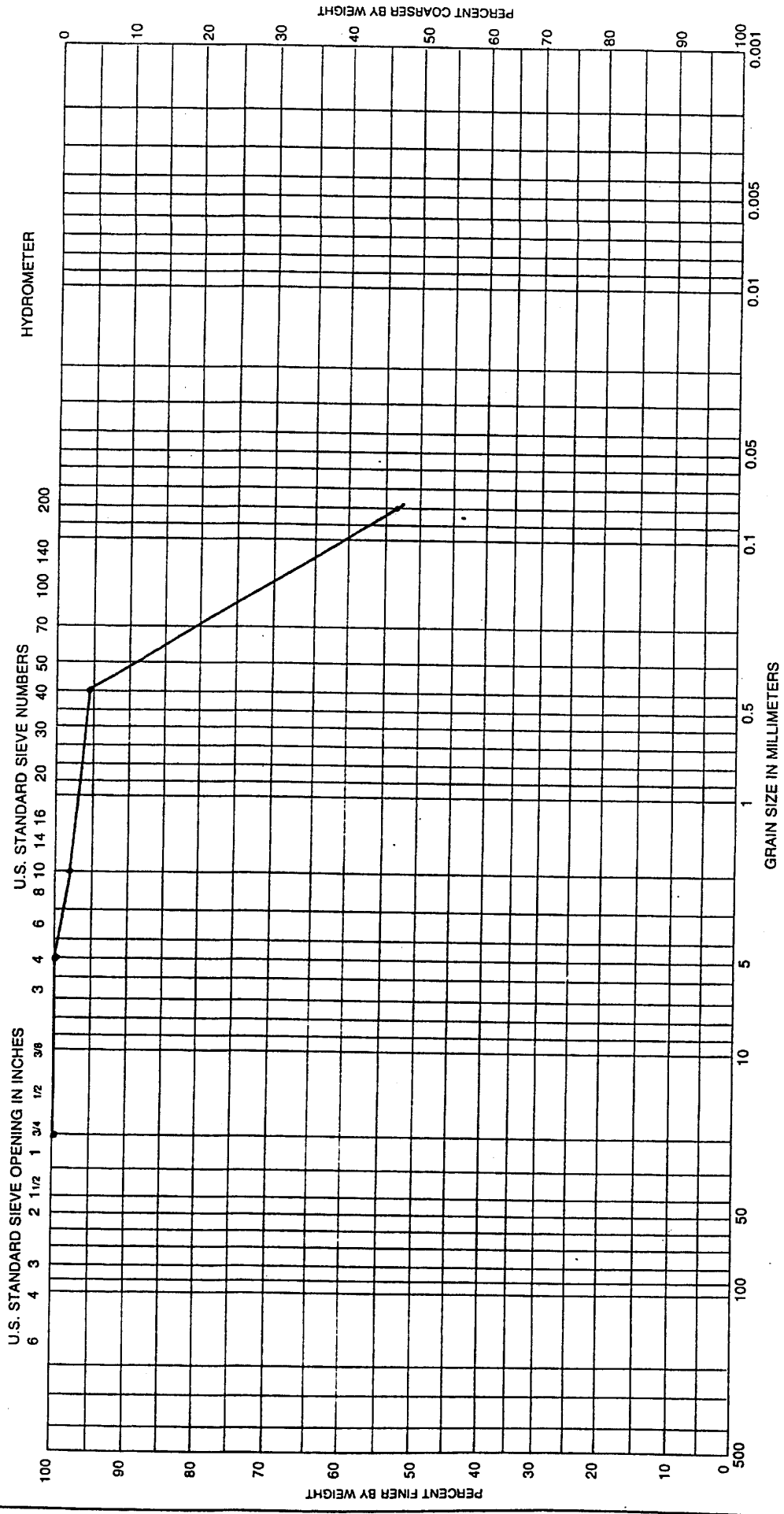
U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

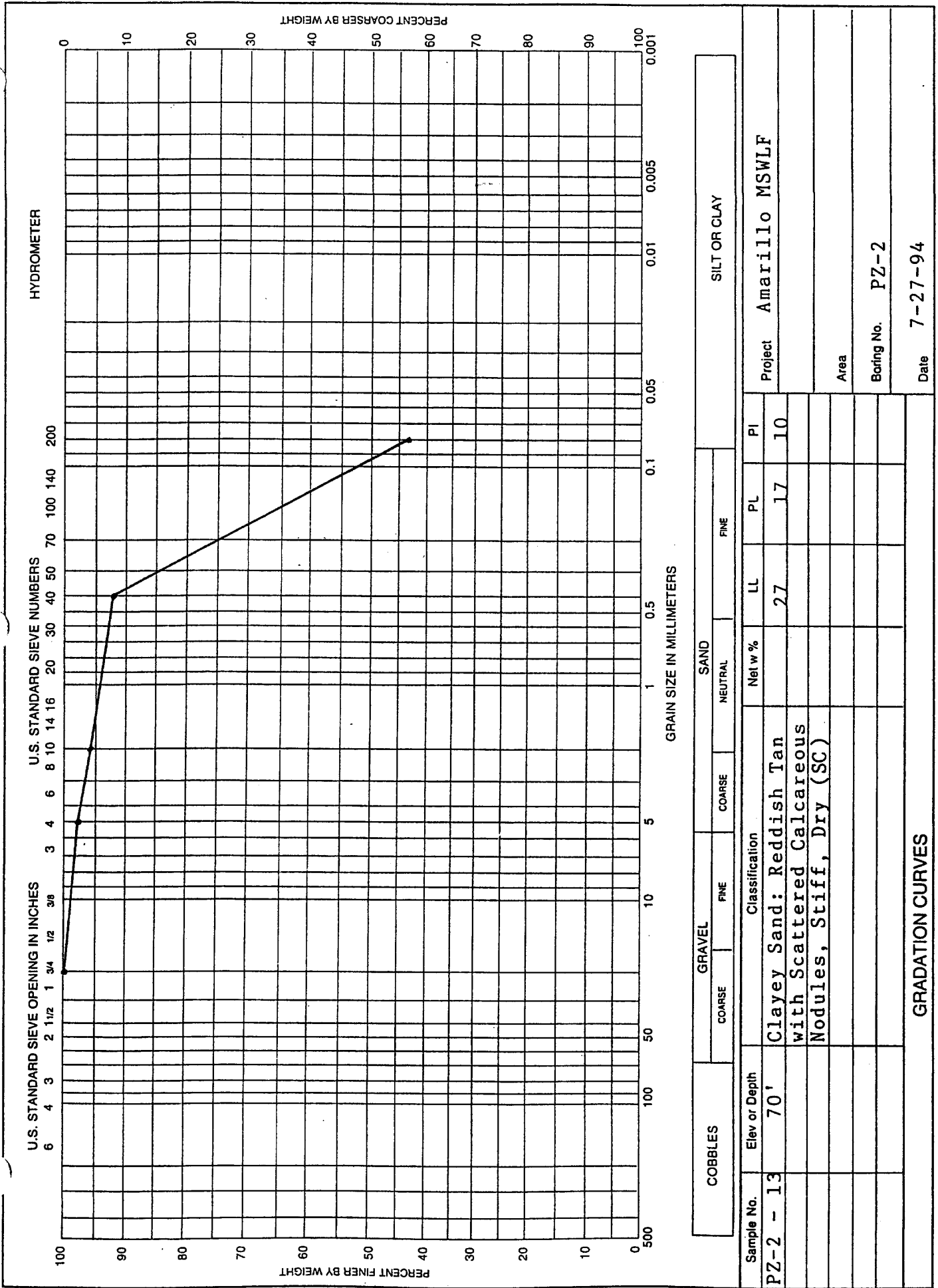


COBBLES		GRAVEL		SAND			SILT OR CLAY		
		COARSE	FINE	NEUTRAL		FINE			
Sample No.	Elev or Depth	Classification			Net w %	LL	PL	PI	Project
PZ-2 - 11	60'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules Stiff, Dry (SC)							Amarillo MSWLF
									Area
									Boring No PZ-2
									Date
									7-27-94

GRADATION CURVES									
------------------	--	--	--	--	--	--	--	--	--



	COBBLES	GRAVEL	SAND	SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE
Sample No.	Classification			
PZ-2 - 12	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules, Stiff, Dry (SC)			
Elev or Depth	65'	LL	24	PL
		PI	18	6
		Area		
		Boring No.	PZ-2	
		Date	7-27-94	
GRADATION CURVES				



Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
PZ-2 - 13	70'	Clayey Sand: Reddish Tan with Scattered Calcareous Nodules, Stiff, Dry (SC)		27	17	10

GRADATION CURVES

Project: Amarillo MSWLF  
Boring No.: PZ-2  
Date: 7-27-94

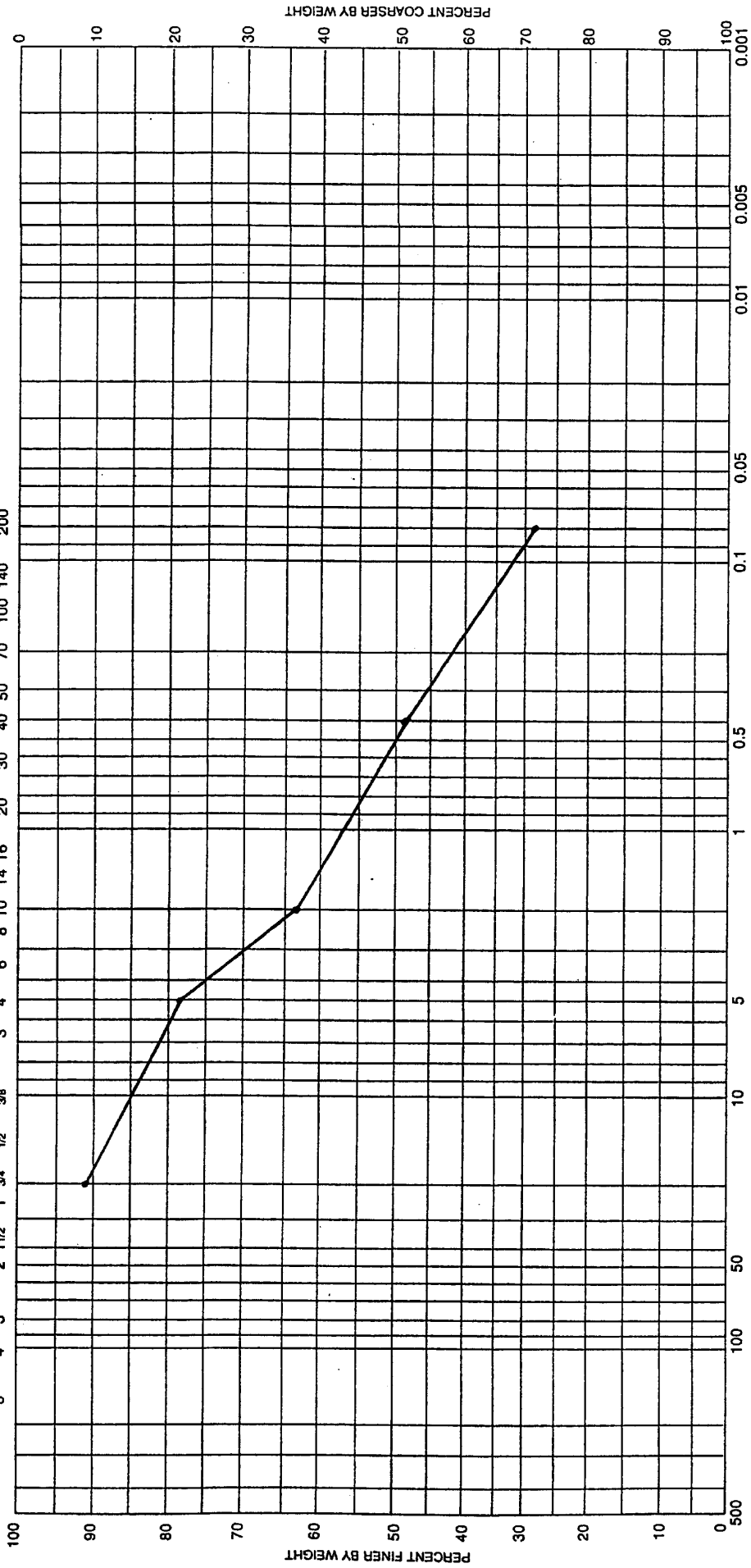




HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



	COBBLES	GRAVEL COARSE FINE	SAND NEUTRAL FINE	SILT OR CLAY
Sample No.	Elev or Depth			
PZ-2 - 15	80'			
	Classification			
	Clayey Sand: Reddish Tan			
	with Scattered Calcareous			
	Nodules, Stiff, Dry (SC)			
			Net w %	LL
			23	23
			PL	PI
			19	4
			Area	
			Boring No.	PZ-2
			Date	7-27-94
GRADATION CURVES				
	Project <b>Amarillo MSWLF</b>			













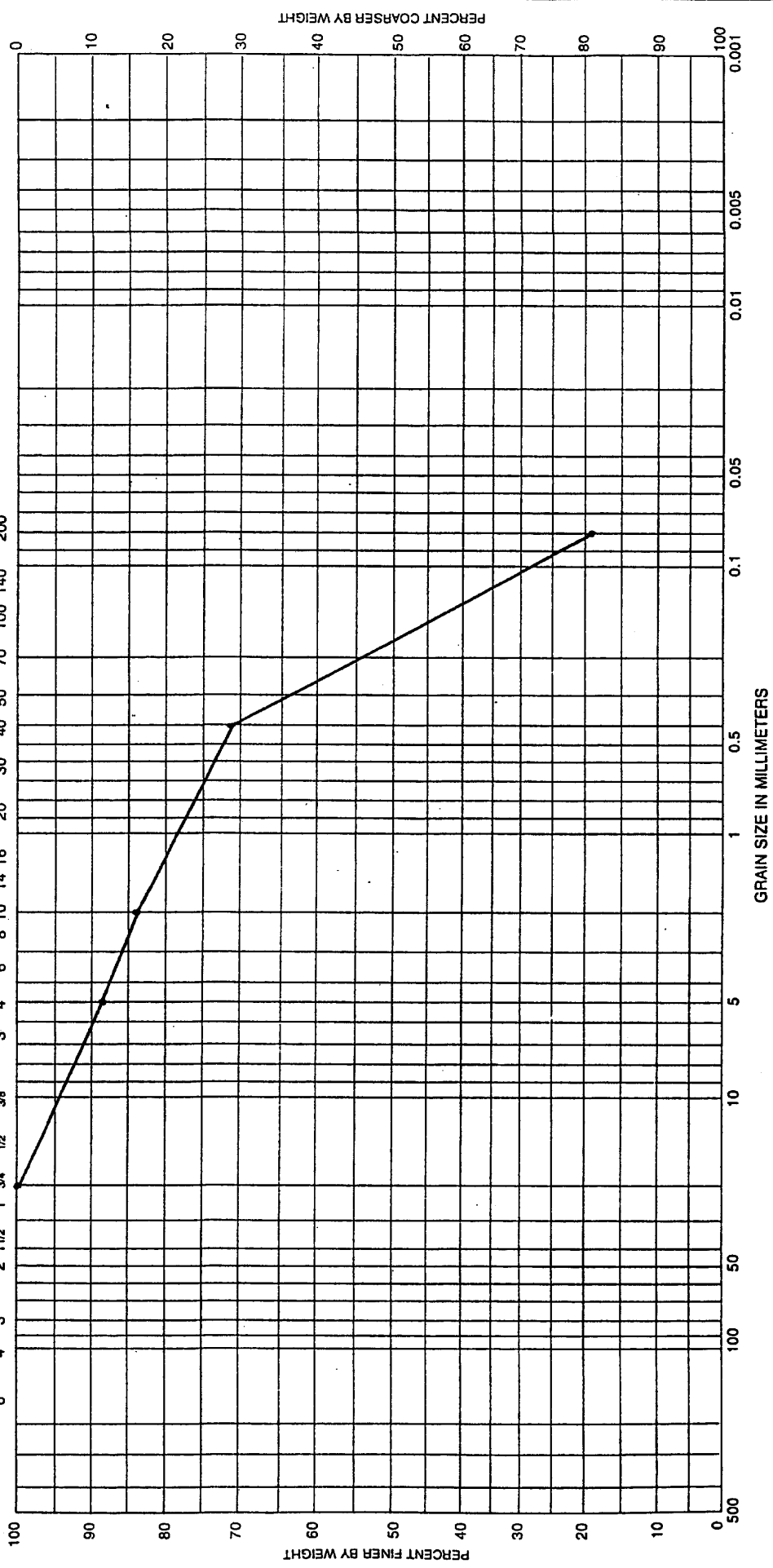




U.S. STANDARD SIEVE OPENING IN INCHES  
 6 4 3 2 1 1/2 1 3/4 1/2 3/8

U.S. STANDARD SIEVE NUMBERS  
 20 30 40 50 60 70 100 140 200

HYDROMETER



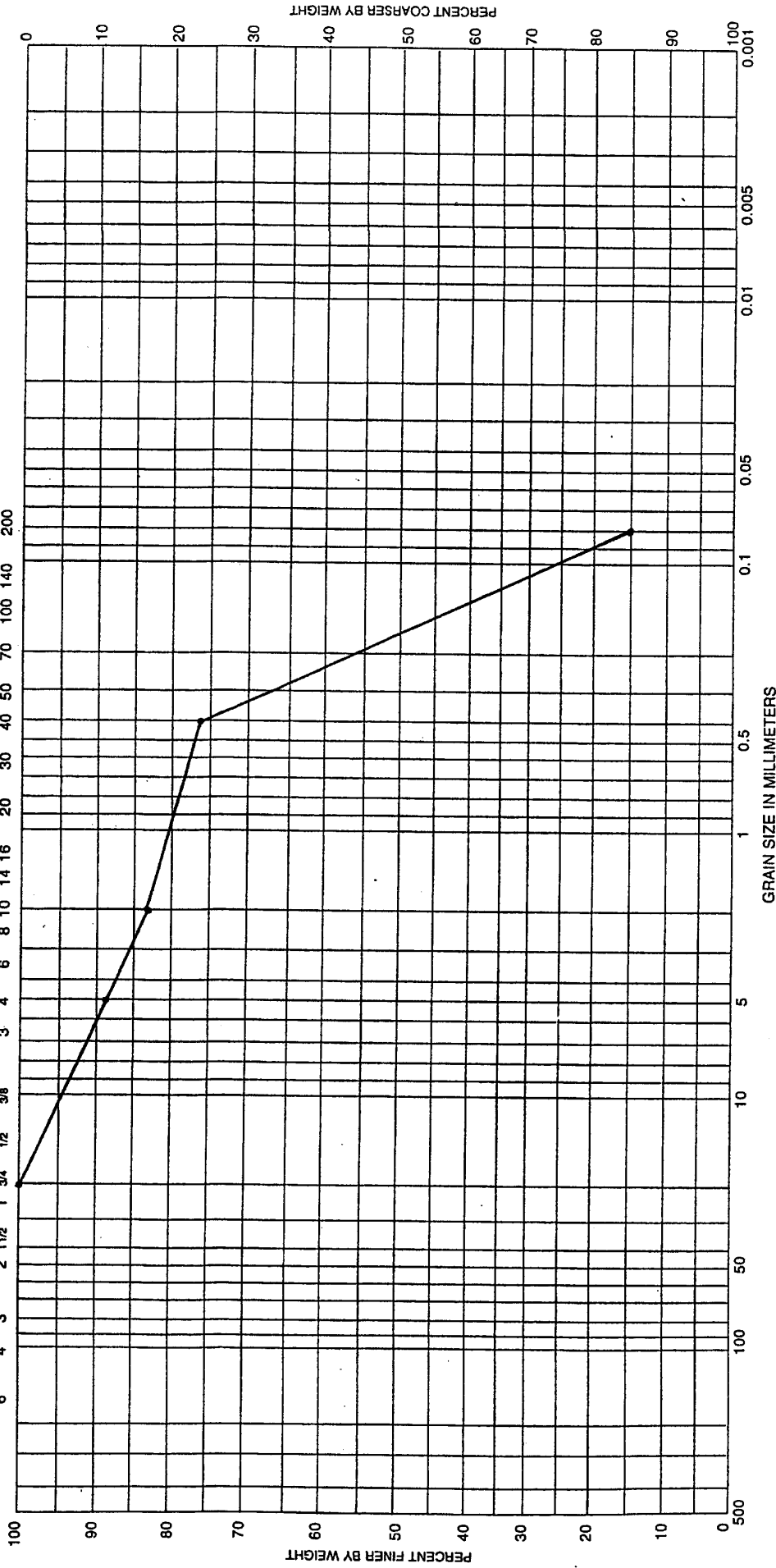
Sample No.	Elev or Depth	GRAVEL			SAND			SILT OR CLAY		
		COARSE	FINE	NET W. %	COARSE	NEUTRAL	FINE	LL	PL	PI
PZ-2 - 27	140'	Classification Clayey Sand: Reddish Tan with Scattered Calcareous Nodules, Stiff, Dry (SC)			Net w. %			19	16	3
Project		Amarillo MSWLF								
Area										
Boring No.		PZ-2								
Date		7-27-94								

GRADATION CURVES

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



PERCENT FINER BY WEIGHT

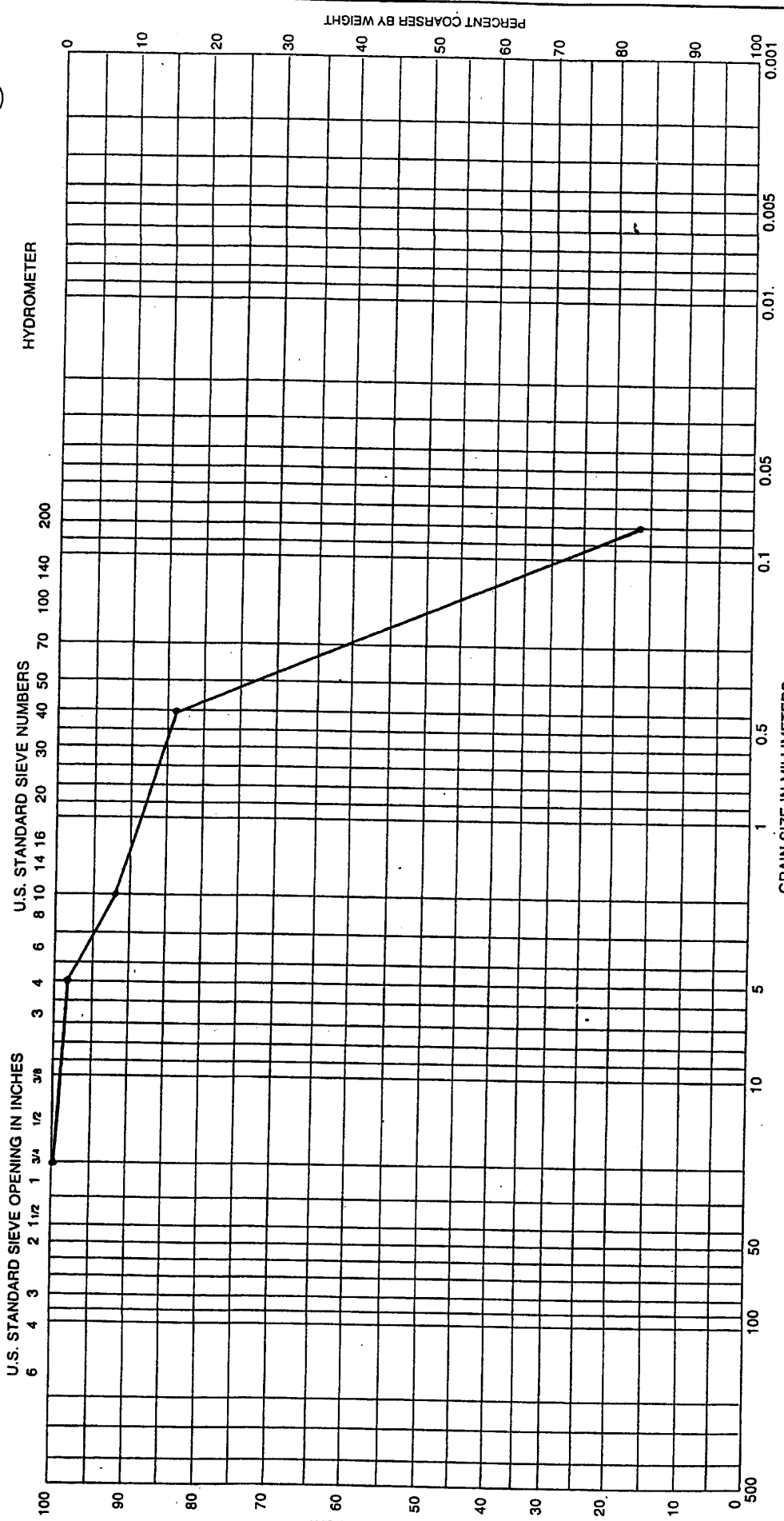
PERCENT COARSER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

Sample No.	Elev or Depth	GRAVEL			SAND			SILT OR CLAY			
		COARSE	FINE	Classification	COARSE	NEUTRAL	FINE	Net w %	LL	PL	PI
PZ-2 - 29	150'			Clayey Sand: Reddish Tan with Scattered Calcareous Nodules (SC)							

Project		Amarillo MSWLF	
Area			
Boring No.		PZ-2	
Date		7-27-94	

GRADATION CURVES



U.S. STANDARD SIEVE OPENING IN INCHES  
 6 4 3 2 1 1/2 1 3/4 1/2 3/8 3/16 1/8 1/16 1/32 1/64 1/128 1/256 1/512

U.S. STANDARD SIEVE NUMBERS  
 10 20 30 40 50 60 70 80 100 140 200

HYDROMETER  
 0.001 0.005 0.01 0.05 0.1 0.5 1 5 10 50 100 200 400 600 800 1000

PERCENT FINER BY WEIGHT  
 0 10 20 30 40 50 60 70 80 90 100

PERCENT COARSER BY WEIGHT  
 0 10 20 30 40 50 60 70 80 90 100

GRAIN SIZE IN MILLIMETERS  
 50 100 500 1 1.18 2.0 2.5 4.75 7.5 10 15 20 30 42.5 60 85 100 150 250 425 600 850 1180 2000

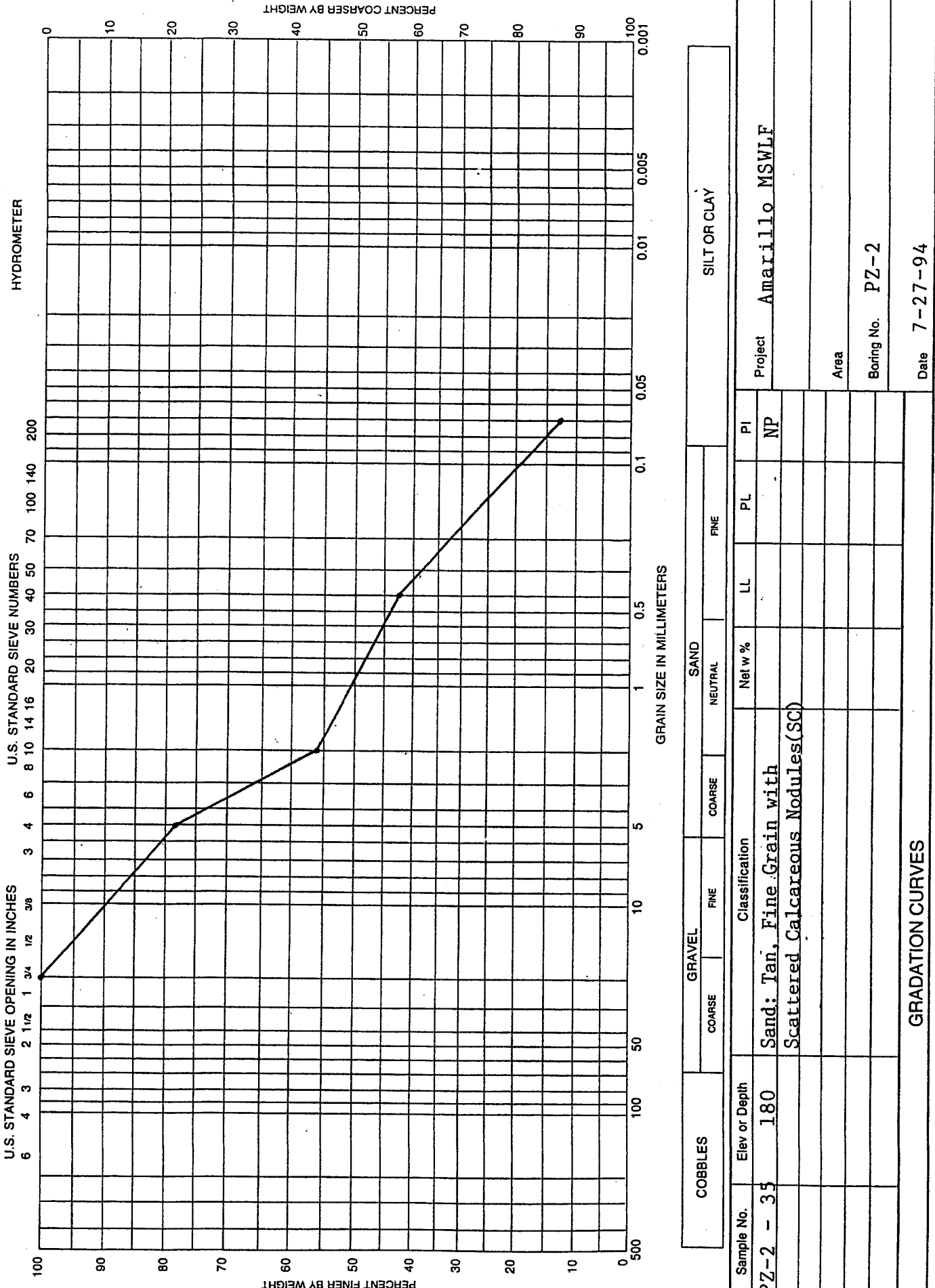
COBBLES	GRAVEL		SAND			SILT OR CLAY		
	COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI

Classification  
 Clayey Sand: Reddish Tan  
 with Scattered Calcareous  
 Nodules (SC)

Sample No. PZ-2 - 31

Elev or Depth 160'

Project						Amarillo MSLWF		
Area								
Boring No.						PZ-2		
Date						7-27-94		
GRADATION CURVES								

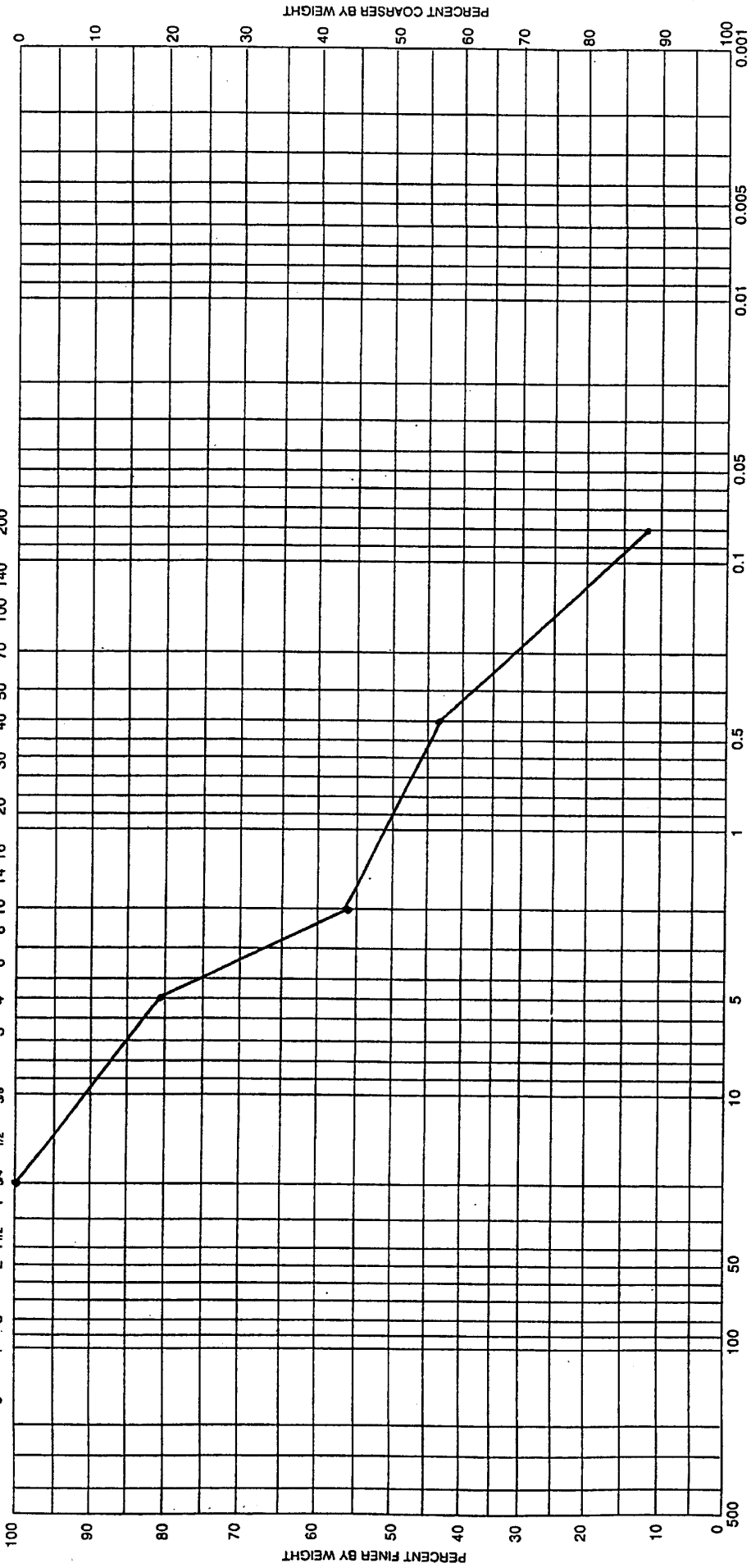


GRADATION CURVES

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

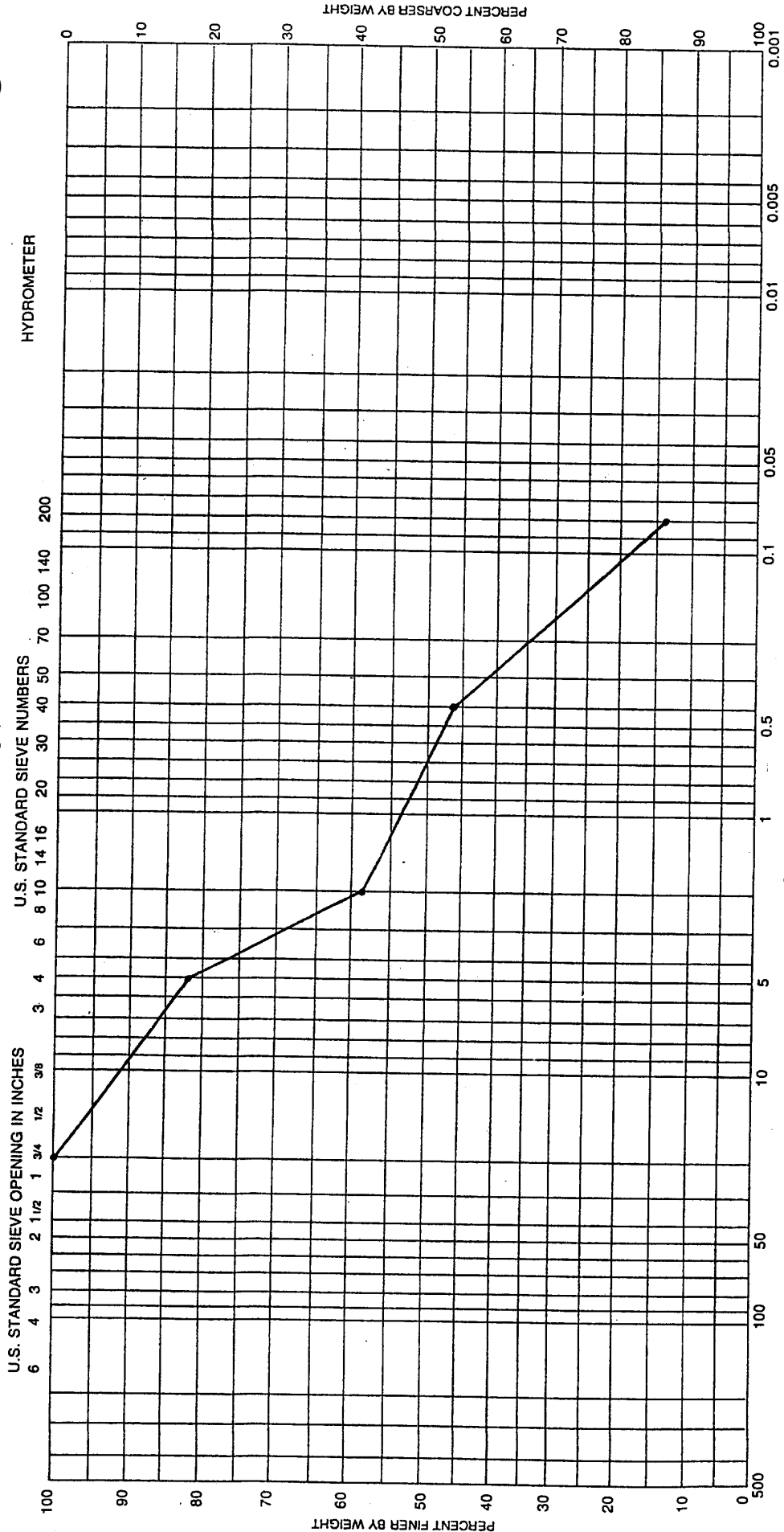


GRAIN SIZE IN MILLIMETERS

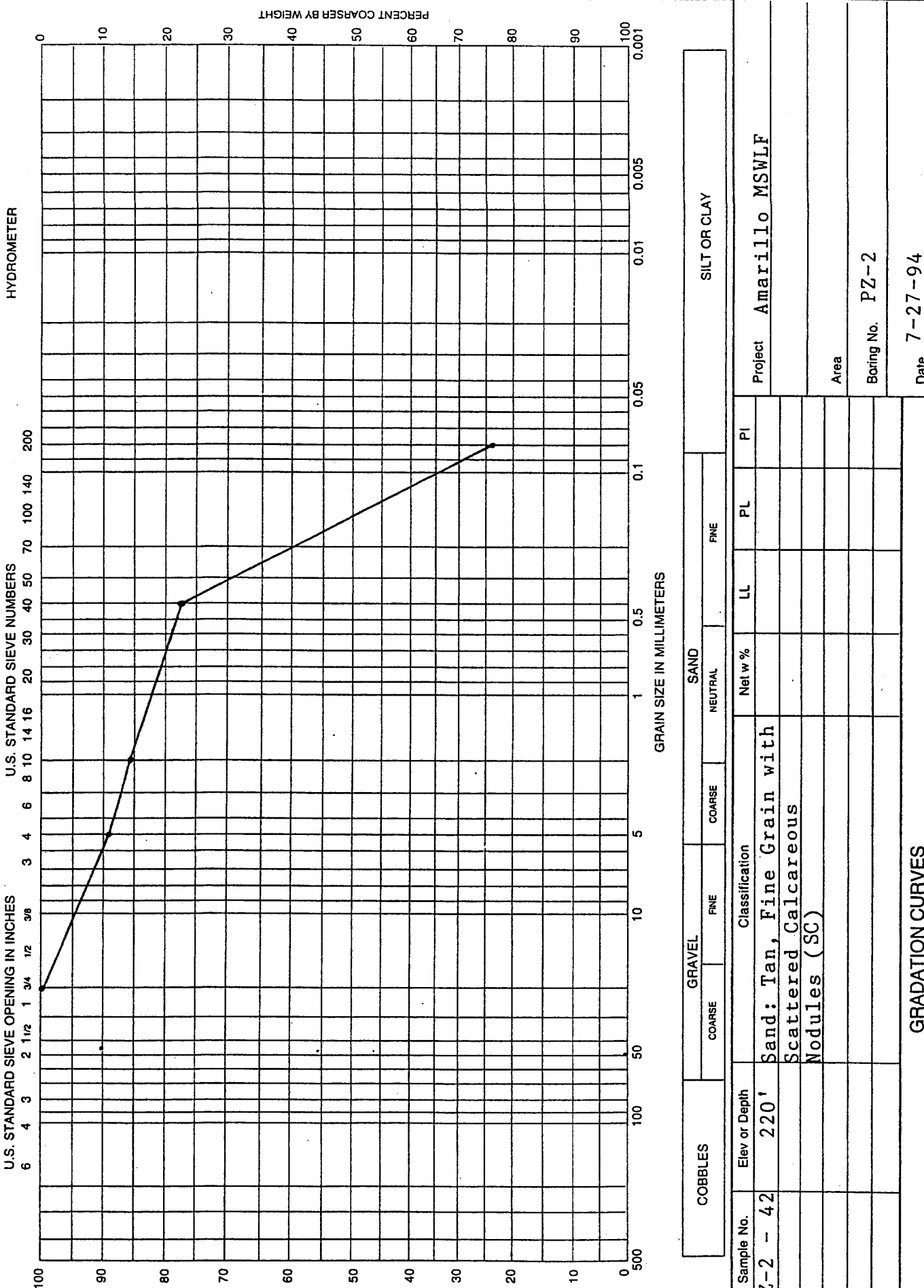
COBBLES	GRAVEL		SAND		SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
PZ-2 - 37	190'	Sand: Tan, Fine Grain with Scattered Calcareous Nodules (SC)					Amarillo MSWLF
							Area
							Boring No. PZ-2
							Date 7-27-94

GRADATION CURVES



COBBLES		GRAVEL		SAND		SILT OR CLAY	
		COARSE	FINE	COARSE	FINE	NEUTRAL	FINE
Sample No.	Elev or Depth	Classification					
PZ-2 - 39	200'	Sand: Tan with Small Pea Gravel (GW)					
		Net w %	LL	PL	PI	Project Amarillo MSWLF	
						Area	
						Boring No. PZ-2	
						Date 7-27-94	
<b>GRADATION CURVES</b>							



U.S. STANDARD SIEVE OPENING IN INCHES: 6, 4, 3, 2, 1 1/2, 1, 3/4, 1/2, 3/8, 3, 4, 6, 8, 10, 14, 16, 20, 30, 40, 50, 70, 100, 140, 200  
 U.S. STANDARD SIEVE NUMBERS

PERCENT COARSER BY WEIGHT

PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

COBBLES		GRAVEL		SAND			SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	FINE		

Sample No.	Elev or Depth		Classification				Net w %	LL	PL	PI
PZ-2 - 42	220'		Sand: Tan, Fine Grain with Scattered Calcareous Nodules (SC)							
Area		Project								
		Amarillo MSWLF								
Boring No.		PZ-2								
Date		7-27-94								

GRADATION CURVES

LOG OF BORING

PZ - 3



# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City Of Amarillo

BORING NO.: PZ-3  
 LOCATION: Amarillo, Texas

Date: 8-22-94 thur 8-25-94

Ground Elevation: 3742.08'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 140' Mud Drilled to 165'									
0	/ / / / /											
5	/ / / / /		Too Hard to Sample									
10	/ / / / /		Caliche Cap: Very Hard Light Tan									
15	/ / / / /		Too Hard to Sample									
20	/ / / / /		Too Hard to Sample									
25	/ / / / / o o o o o		Clayey Sand: Reddish Brown With Calcareous Nodules (SC)		50-2"	5.4					4.0+	
30	/ / / / / o o o o o		Continued on Page 2									

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-3  
 LOCATION: Amarillo, Texas

Date: 8-22-94 thur 8-25-94

Ground Elevation: 3742.08'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 140' Mud drilled to 165'									
30	o		Too Hard to Sample									
	o		Clayey Sand: Reddish Tan With Calcareous Nodules (SC)									
35	o	X			15-16"	4.6				NP	1.50	21.3
	o				42-12"							
	o		50-12"									
40	o	X	15-6"	4.1				NP		36.6		
	o		37-12"									
	o		50-12"									
45	o	X	18-6"	4.0				NP		12.1		
	o		50-12"									
50	o	X	10-6"	3.7				NP		9.1		
	o		36-12"									
	o		50-18"									
55	o	X	32-6"	3.4			21	19	3	2.50	13.9	
	o		50-9"									
60	o	X	Continued on Page 3									

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-3  
 LOCATION: Amarillo, Texas

Date: 8-22-94 thur 8-25-94

Ground Elevation: 3742.08'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 140' Mud Drilled to 165'									
			DESCRIPTION OF STRATUM									
60	○	X	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)									
65	○	X	36-6"	3.1					NP		15.9	
70	○	X	39-6"	4.0						2.75	24.7	
75	○	X	43-6"	3.8							23.1	
			50-7"									
80	○	X	32-6"	3.0							24.3	
			50-8"									
85	○	X	37-6"	2.8							15.2	
			50-8"									
90	○	X										

Continued on Page 4

# LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-3  
 LOCATION: Amarillo, Texas

Date: 8-22-94 thur 8-25-94

Ground Elevation: 3742.08'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 140' Mud Drilled to 165'									
			DESCRIPTION OF STRATUM									
90	(Symbol: Diagonal lines with circles)	X	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)									
95												
100	(Symbol: Diagonal lines with circles)	X	50-5"									
105												
110	(Symbol: Diagonal lines with circles)	X	44-6"									
115												
120	(Symbol: Diagonal lines with circles)	X	Continued on Page 5									

## LOG OF BORING

PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-3  
 LOCATION: Amarillo, Texas

Date: 8-22-94 thur 8-25-94

Ground Elevation: 3742.08'

DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary		SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE
			GROUNDWATER INFORMATION: Air Drilled to 140' Mud Drilled to 165'									
			DESCRIPTION OF STRATUM									
120	(Symbol: Diagonal lines with dots)	X	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)		42-6"	3.0					NP	9.9
					50-9"							
125												
130	(Symbol: Diagonal lines with dots)	X			50-6"	1.8					NP	15.3
135	(Symbol: Irregular shapes)	X	Sand: Tan (Well Sorted) Fine Grain With Pea Gravel (GW)									
140	(Symbol: Diagonal lines with dots)	X	Clayey Sand: Reddish Tan With Pea Gravel (SC)		12-6"	2.7		26	22	4		16.9
					50-12"							
145	(Symbol: Irregular shapes)	X	Sand: Reddish Tan (Well Sorted) Fine Grain With Small Gravel (GW)			MD						
150			Continued on Page 6									


## LOG OF BORING

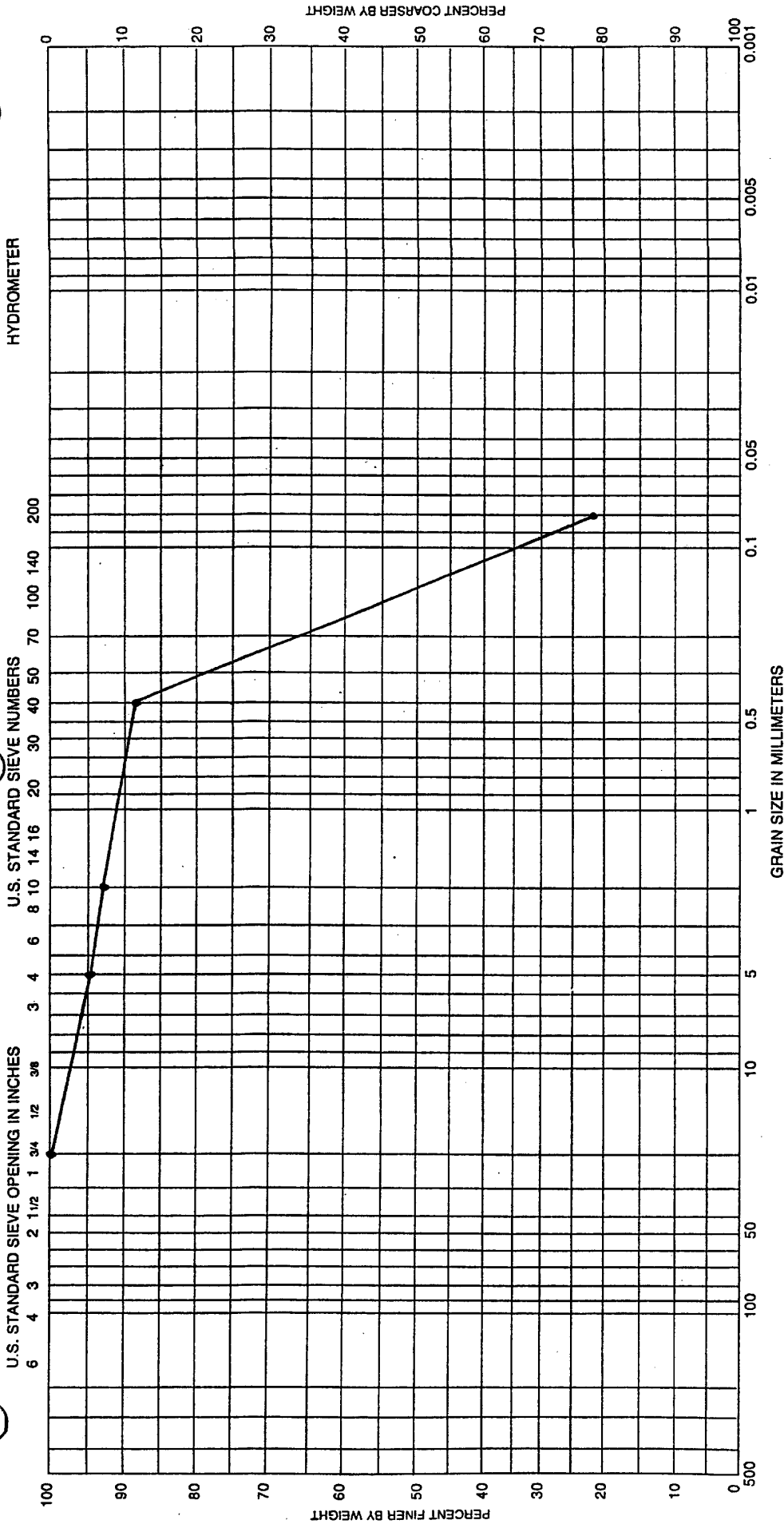
PROJECT: Amarillo MSWLF  
 CLIENT: City of Amarillo

BORING NO.: PZ-3  
 LOCATION: Amarillo, Texas

Date: 8-22-94 thur 8-25-94

Ground Elevation: 3742.08'

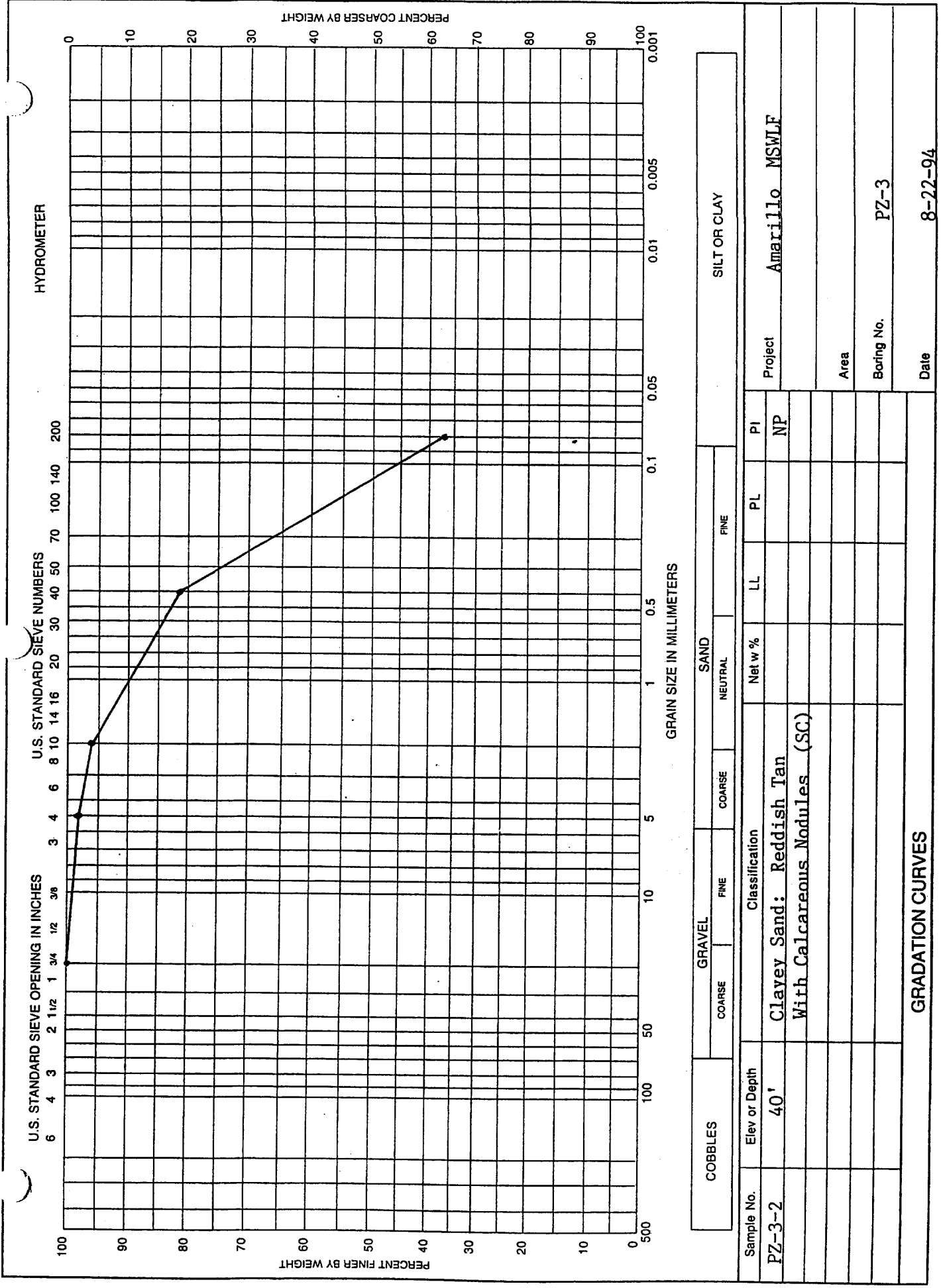
DEPTH, FEET	SYMBOL	SAMPLE	DRILLING METHOD: Air/Mud Rotary	SPT BLOWS / FT PENETROMETER TSF	MOISTURE CONTENT, %	DRY DENSITY, PCF	LIQUID LIMIT, LL	PLASTIC LIMIT, PL	PLASTICITY INDEX, PI	UNCONFINED COMPRESSIVE STRENGTH, TSF	% PASSING NO. 200 SIEVE	
			GROUNDWATER INFORMATION: Air Drilled to 140' Mud Drilled to 165'									DESCRIPTION OF STRATUM
150			Clayey Sand: Reddish Tan With Occasional Small Pea Gravel (SC)		MD							
155												
160						MD						
165				*T.D. - 165'								



COBBLES		GRAVEL		SAND			SILT OR CLAY	
COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
PZ-3-1	35'	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)				NP
Project						
Amarillo MSWLF						
Area						
Boring No.						
PZ-3						
Date						
8-22-94						

GRADATION CURVES



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

PERCENT COARSER BY WEIGHT

PERCENT FINER BY WEIGHT

GRAIN SIZE IN MILLIMETERS

SILT OR CLAY

GRADATION CURVES

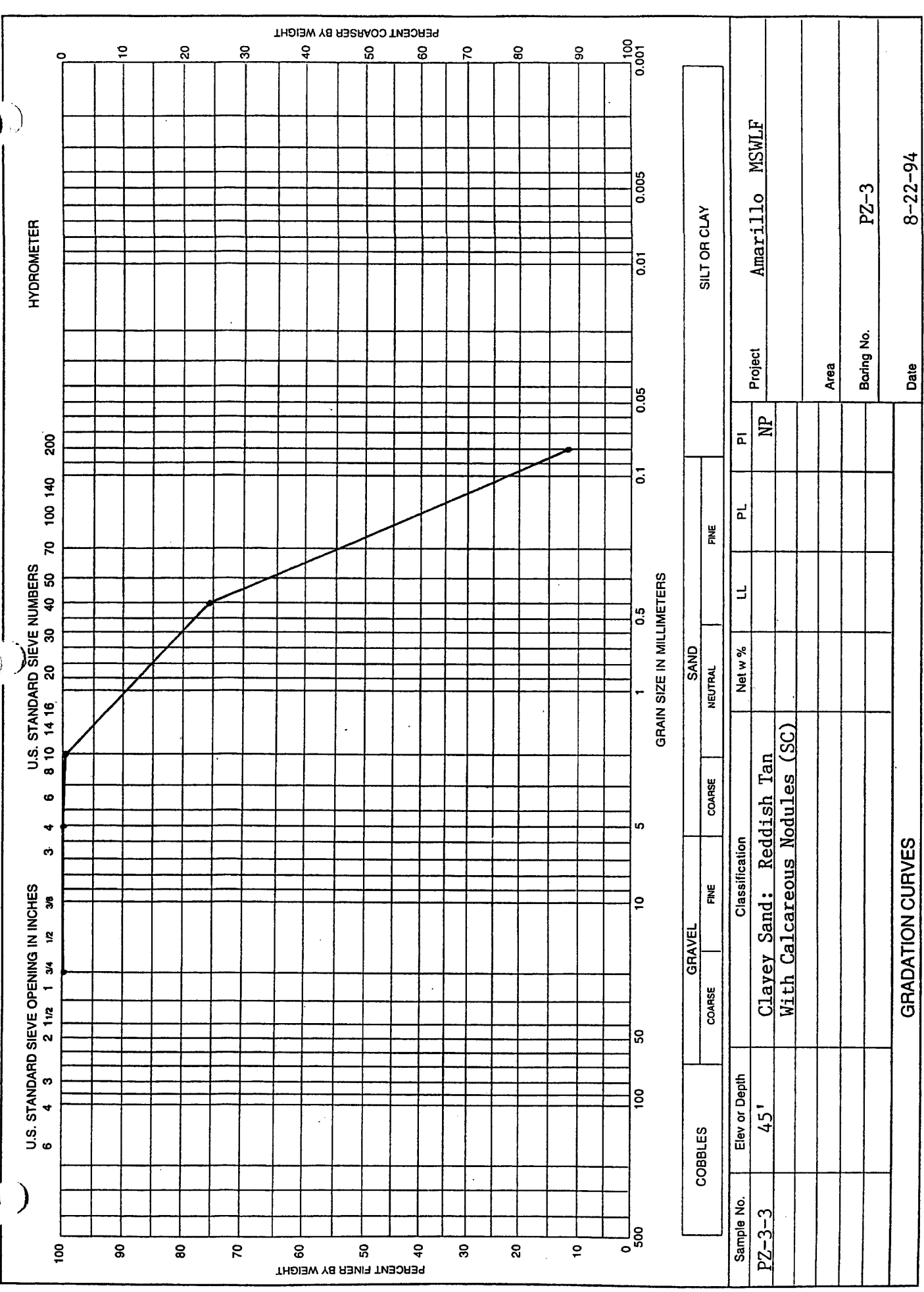
Project Amarillo MSWLF

Area

Boring No. PZ-3

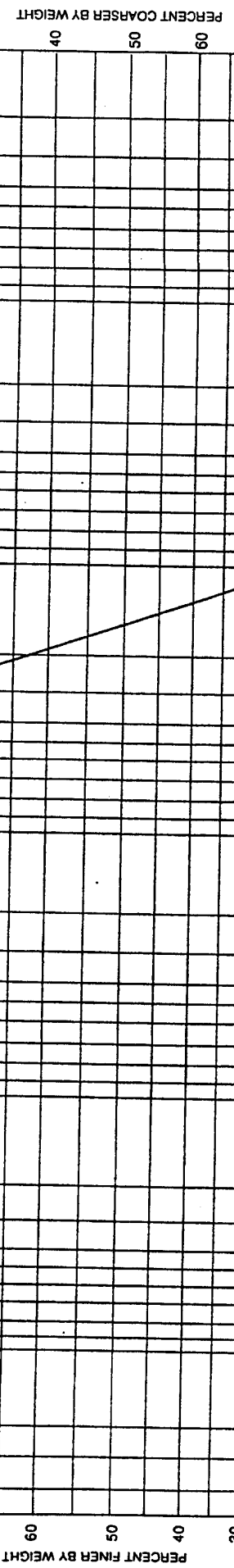
Date 8-22-94





Sample No.	Elev or Depth	Classification					Net w %	LL	PL	PI	Project	Area	Boring No.	Date
		COARSE	FINE	GRAVEL	SAND									
PZ-3-3	45'	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)									Amarillo	MSWLF	PZ-3	8-22-94
GRADATION CURVES														

QUEST-PETERSON TESTING LABORATORY, INC.



U.S. STANDARD SIEVE OPENING IN INCHES  
 6 4 3 2 1 1/2 1 3/4 1/2 3/8  
 3 4 6 8 10 14 16 20 30 40 50 70 100 140 200

HYDROMETER

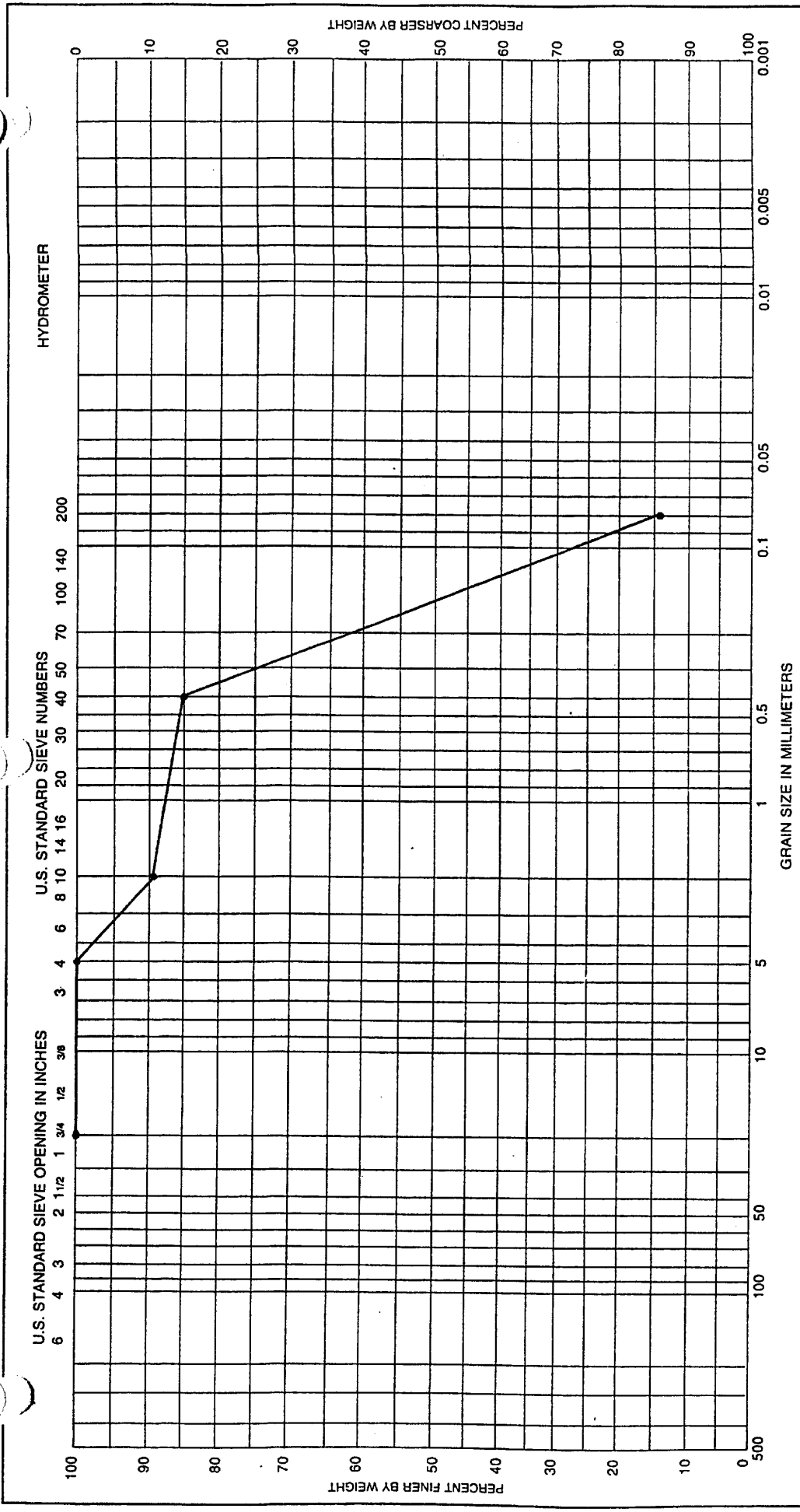
U.S. STANDARD SIEVE NUMBERS  
 10 20 30 40 50 60 70 80 90 100  
 0.075 0.15 0.3 0.6 1.18 2.5 5 10 20 40 75 150 300 600

PERCENT FINER BY WEIGHT  
 0 10 20 30 40 50 60 70 80 90 100  
 0 10 20 30 40 50 60 70 80 90 100

GRAIN SIZE IN MILLIMETERS  
 500 250 100 75 50 25 15 10 7.5 5 3.75 3 2.5 2 1.5 1.25 1 0.75 0.6 0.5 0.425 0.375 0.3 0.25 0.2 0.15 0.125 0.1 0.075 0.06 0.05 0.0425 0.0375 0.03 0.025 0.02 0.015 0.0125 0.01 0.0075 0.006 0.005 0.00425 0.00375 0.003 0.0025 0.002 0.0015 0.00125 0.001 0.00075 0.0006 0.0005 0.000425 0.000375 0.0003 0.00025 0.0002 0.00015 0.000125 0.0001

COBBLES		GRAVEL		SAND			SILT OR CLAY						
		COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI				
Sample No.	Elev or Depth	Classification				Net w %							
PZ-3-4	50'	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)										NP	
Project											Amarillo MSWLF		
Area													
Boring No.											PZ-3		
Date											8-22-94		

GRADATION CURVES



<b>COBBLES</b>	<b>GRAVEL</b>	<b>SAND</b>
COARSE	FINE	NEUTRAL
COARSE	FINE	FINE

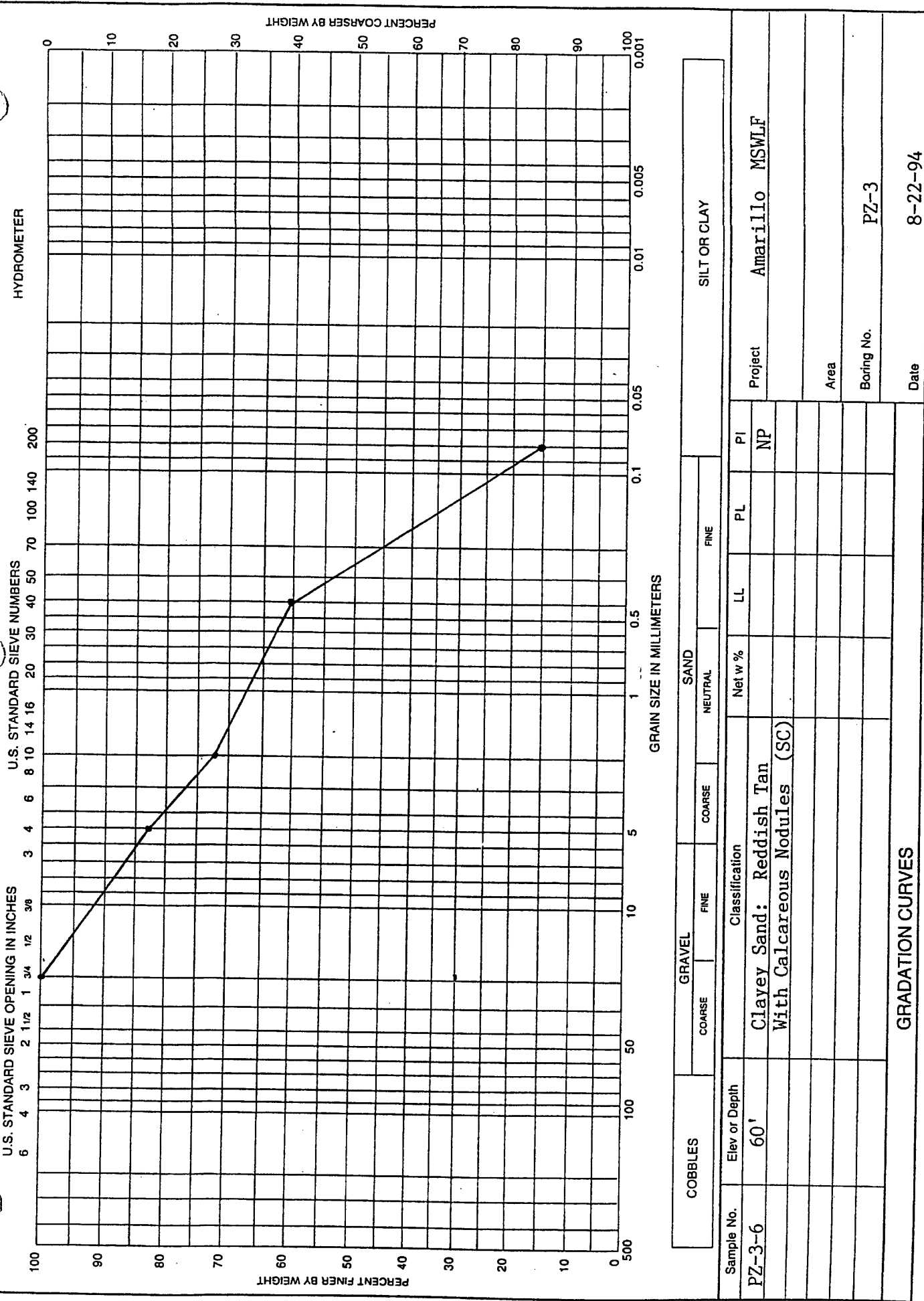
  

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
PZ-3 - 5	55'	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)		21	19	3

Project	Amarillo MSWLF
Area	
Boring No.	PZ-3
Date	8-22-94

GRADATION CURVES



HYDROMETER

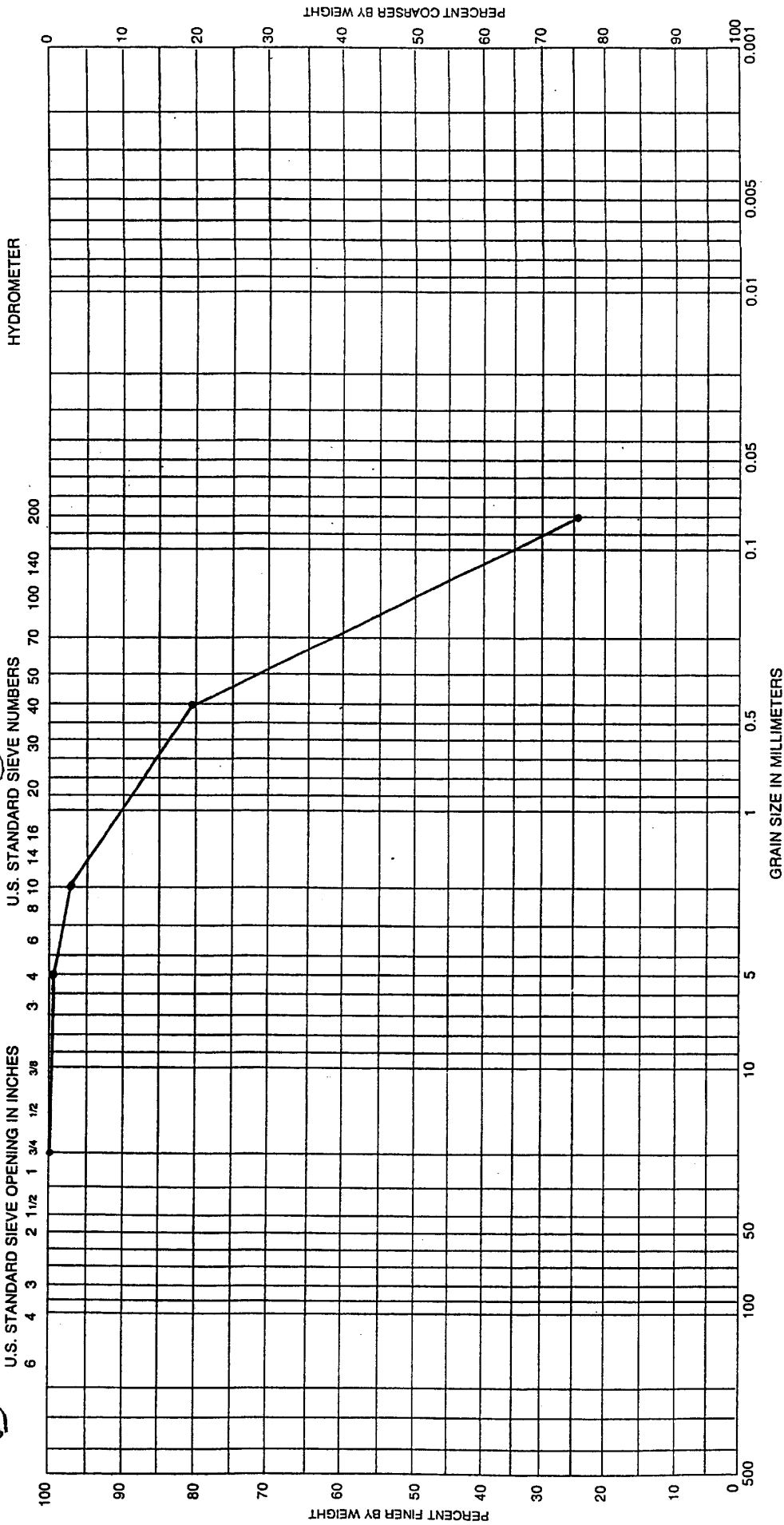
U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

COBBLES		GRAVEL		SAND			SILT OR CLAY	
COARSE	FINE	COARSE	NEUTRAL	FINE	LL	PL	PI	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
PZ-3-6	60'	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)				NP
Project		Amarillo MSWLF				
Area						
Boring No.		PZ-3				
Date		8-22-94				

GRADATION CURVES

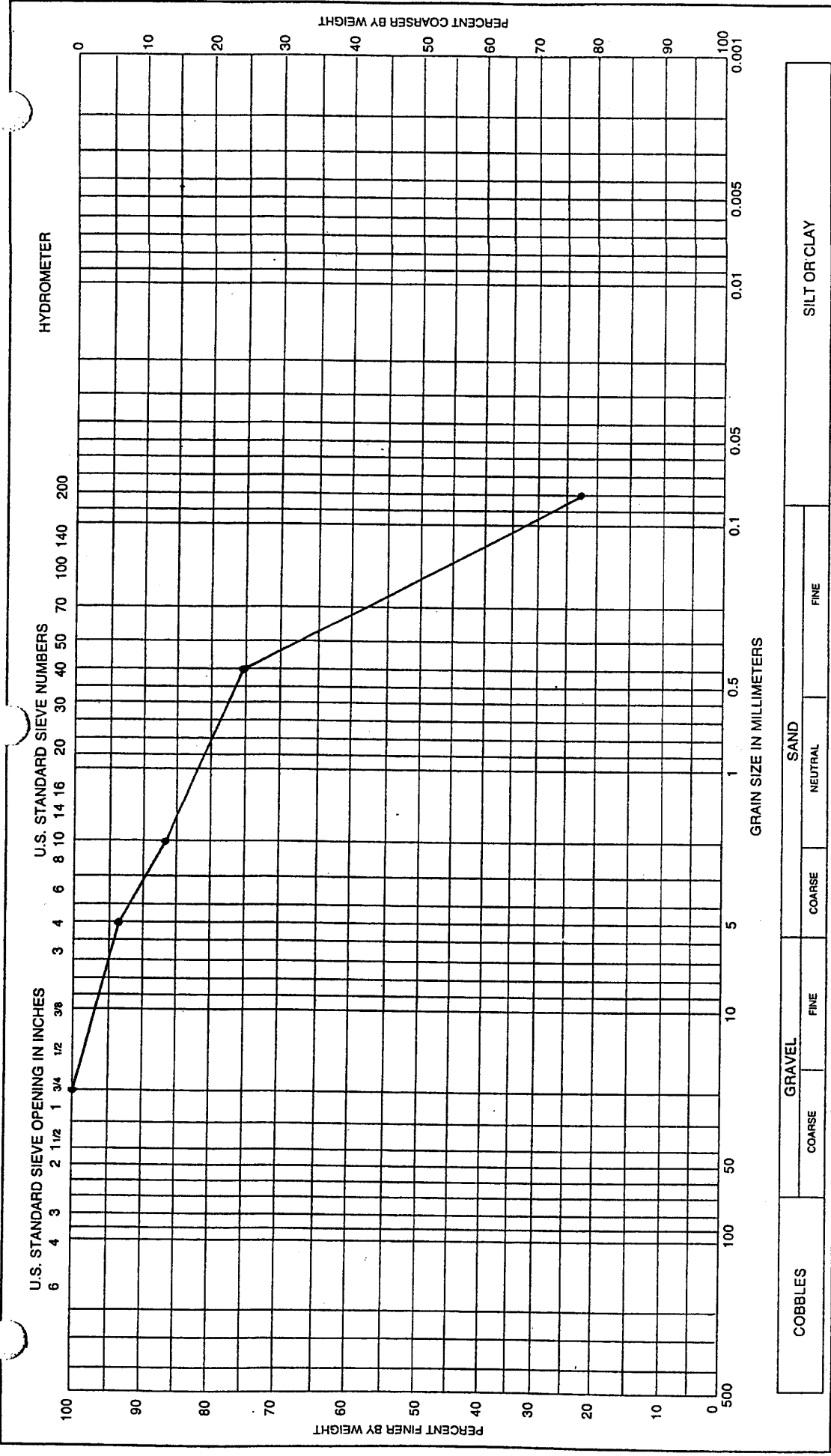


COBBLES	GRAVEL		SAND		SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI
PZ-3-7	65'	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)				

Project	Amarillo MSWLF
Area	
Boring No.	PZ-3
Date	8-22-94

GRADATION CURVES



COBBLES		GRAVEL		SAND			SILT OR CLAY	
Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project	Area
PZ-3-8	70'	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)					Amarillo	MSWLF

GRADATION CURVES

Date 8-22-94

Boring No. PZ-3

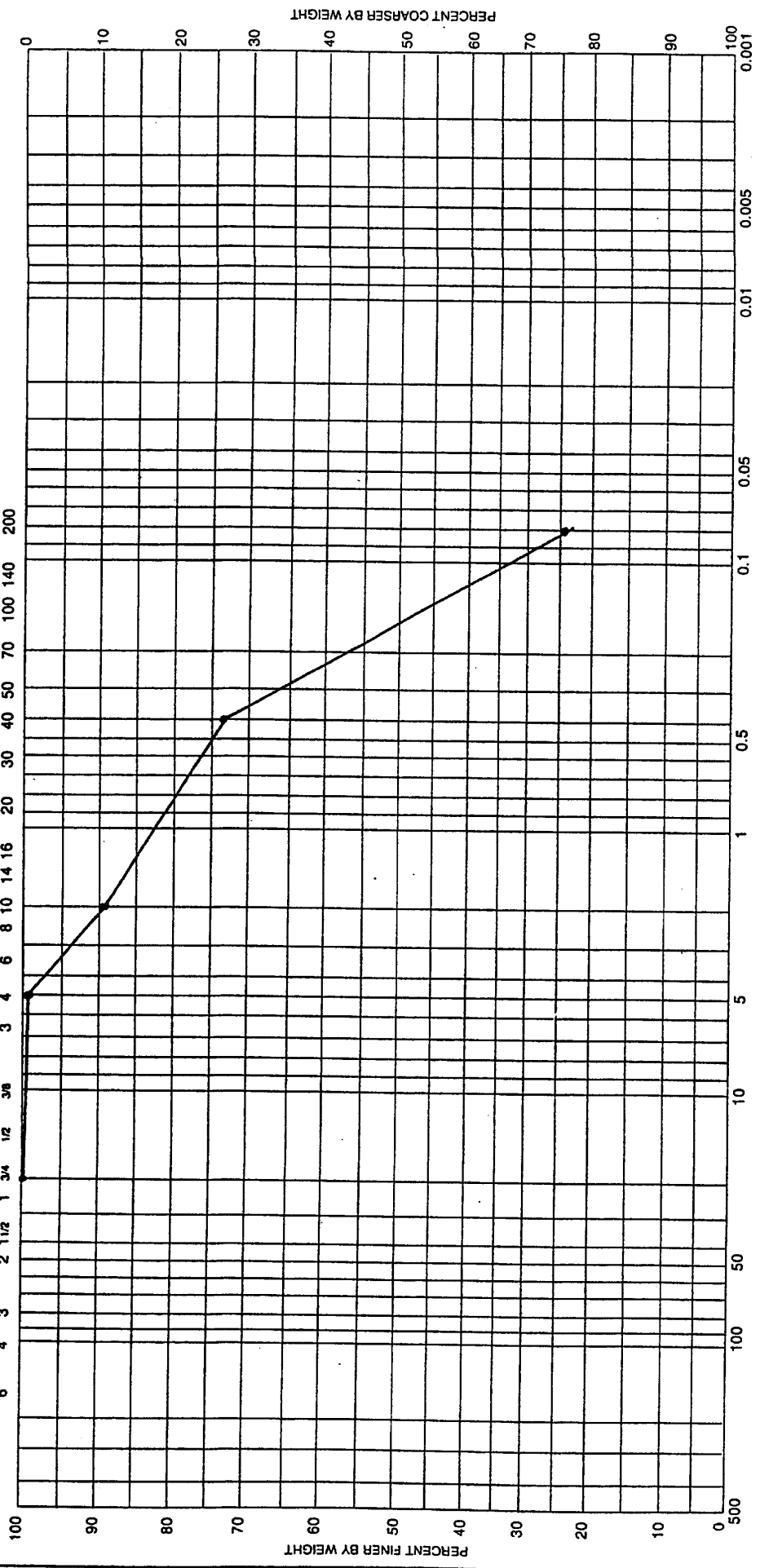
Area

Project Amarillo MSWLF

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



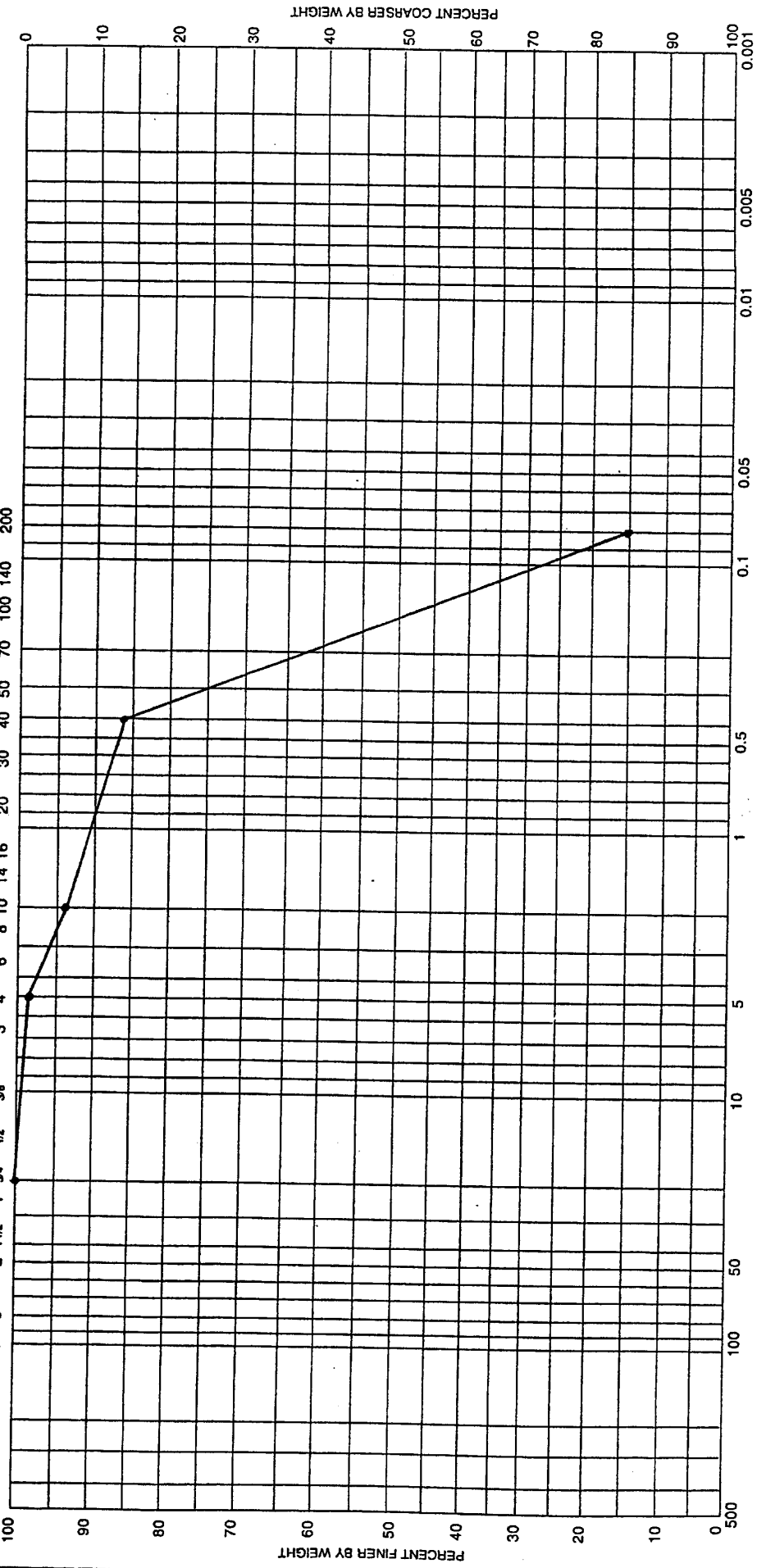
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	NEUTRAL	FINE		

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project	Amarillo MSWLF
PZ-3-9	75'	Clayey Sand; Reddish Tan With Calcareous Nodules (SC)						
							Area	
							Boring No.	PZ-3
							Date	8-22-94
GRADATION CURVES								

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



GRAIN SIZE IN MILLIMETERS

COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	NEUTRAL	FINE	

Sample No.	Elev or Depth	Classification	Net w %	LL	PL	PI	Project
PZ-3-10	80'	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)					Amarillo MSWLF
							Area
							Boring No.
							PZ-3
							Date
							8-22-94

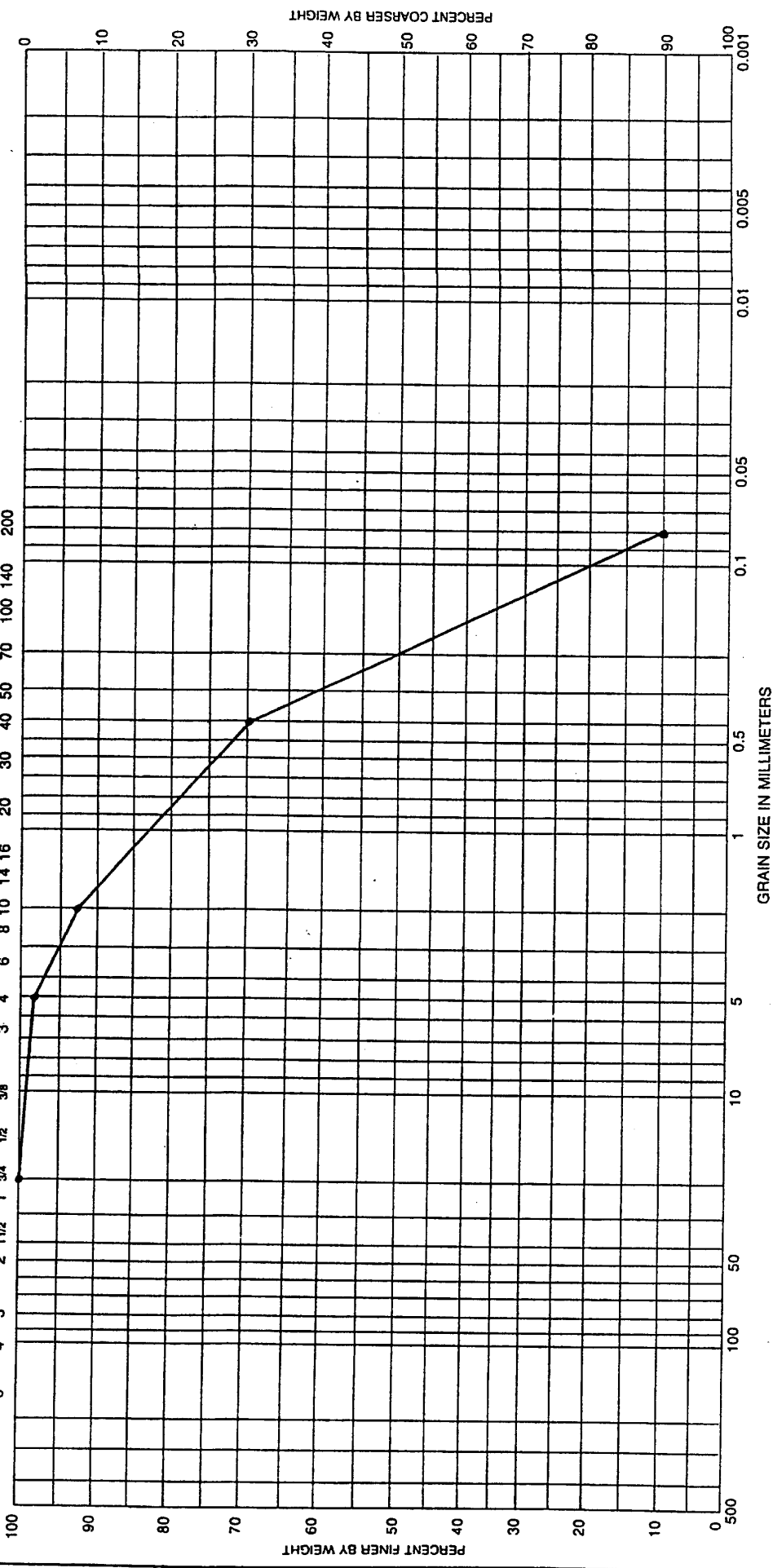
GRADATION CURVES



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES



Sample No.	Elev or Depth	Classification	SAND			PI
			Net w %	LL	PL	
PZ-3-11	90'	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)				NP

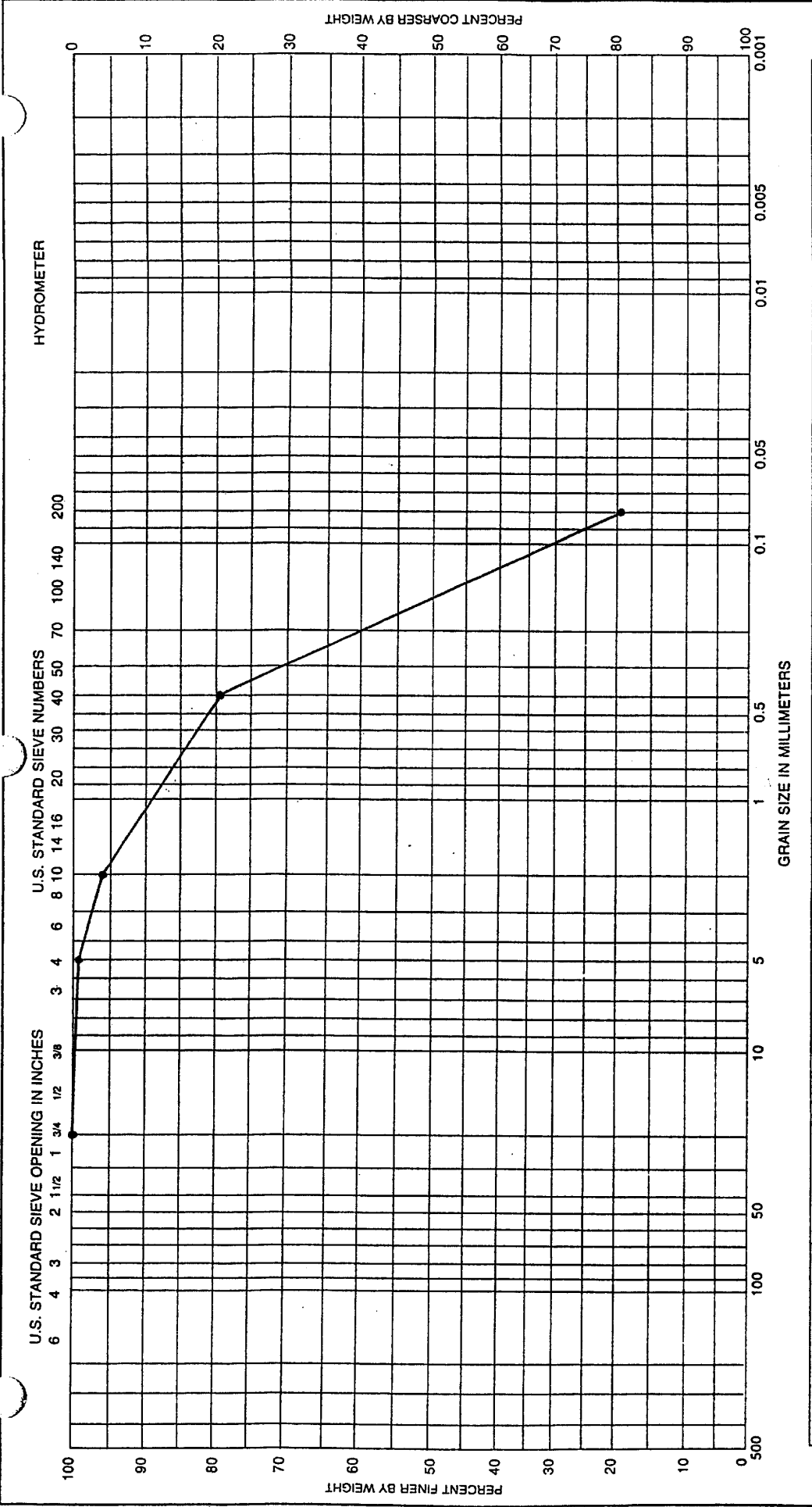
  

COBBLES		GRAVEL		SAND			SILT OR CLAY	
		COARSE	FINE	COARSE	NEUTRAL	FINE		

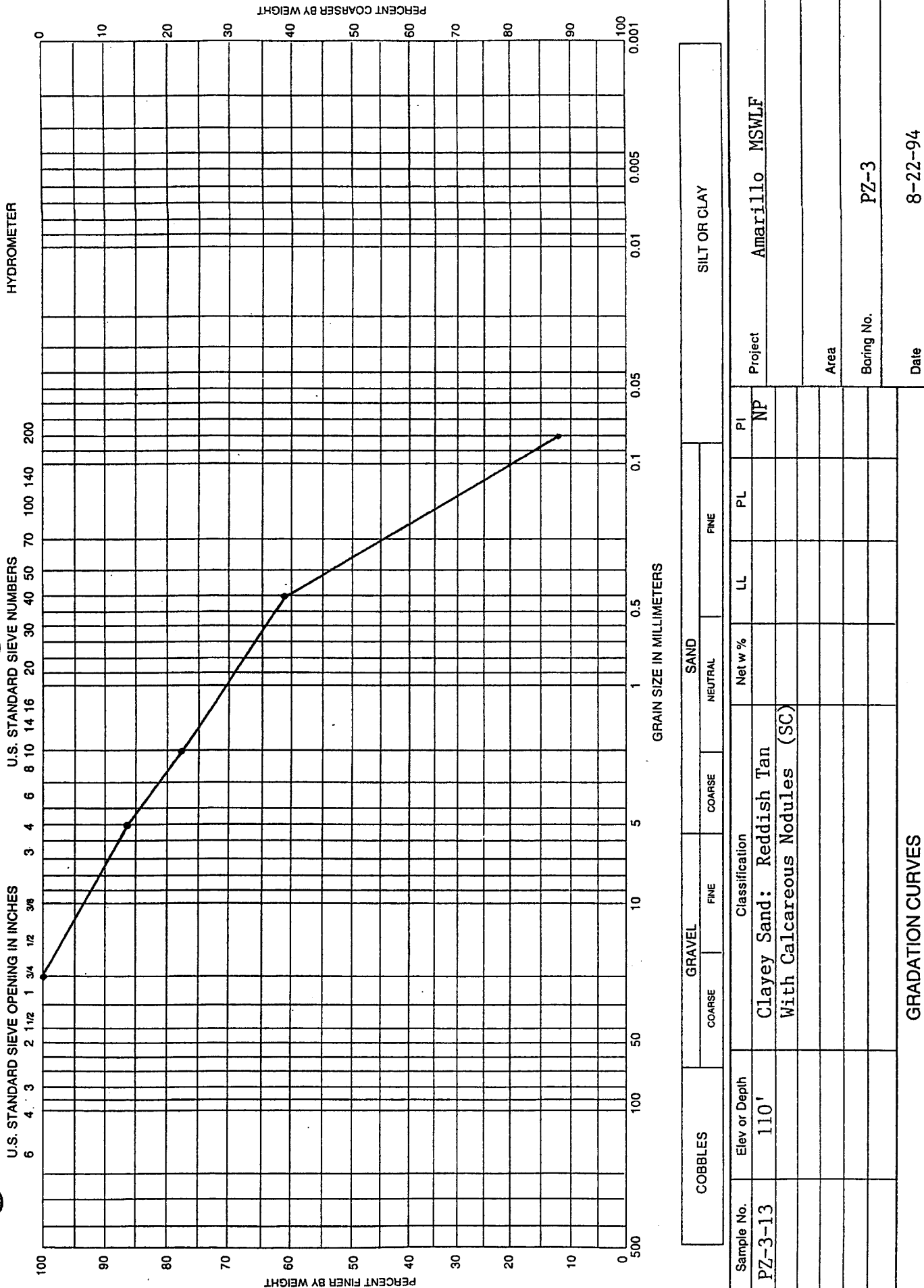
  

Project	Amarillo MSWLF
Area	
Boring No.	PZ-3
Date	8-22-94

GRADATION CURVES



COBBLES		GRAVEL		SAND		SILT OR CLAY	
COARSE		FINE		COARSE		FINE	
Classification				Net w %	LL	PL	PI
Clayey Sand: Reddish Tan With Calcareous Nodules (SC)					22	18	4
Sample No.	Elev or Depth						
PZ-3 - 12	100'	Project <b>Amarillo MSWLF</b>					
Area				Boring No. <b>PZ-3</b>			
Date				<b>8-22-94</b>			
<b>GRADATION CURVES</b>							



Sample No.	Elev or Depth	Classification	GRAVEL			SAND			PI
			COARSE	FINE	NETURAL	NETURAL	FINE	PL	
PZ-3-13	110'	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)				Net w %	LL	PL	NP

GRADATION CURVES

Date 8-22-94

Boring No. PZ-3

Area

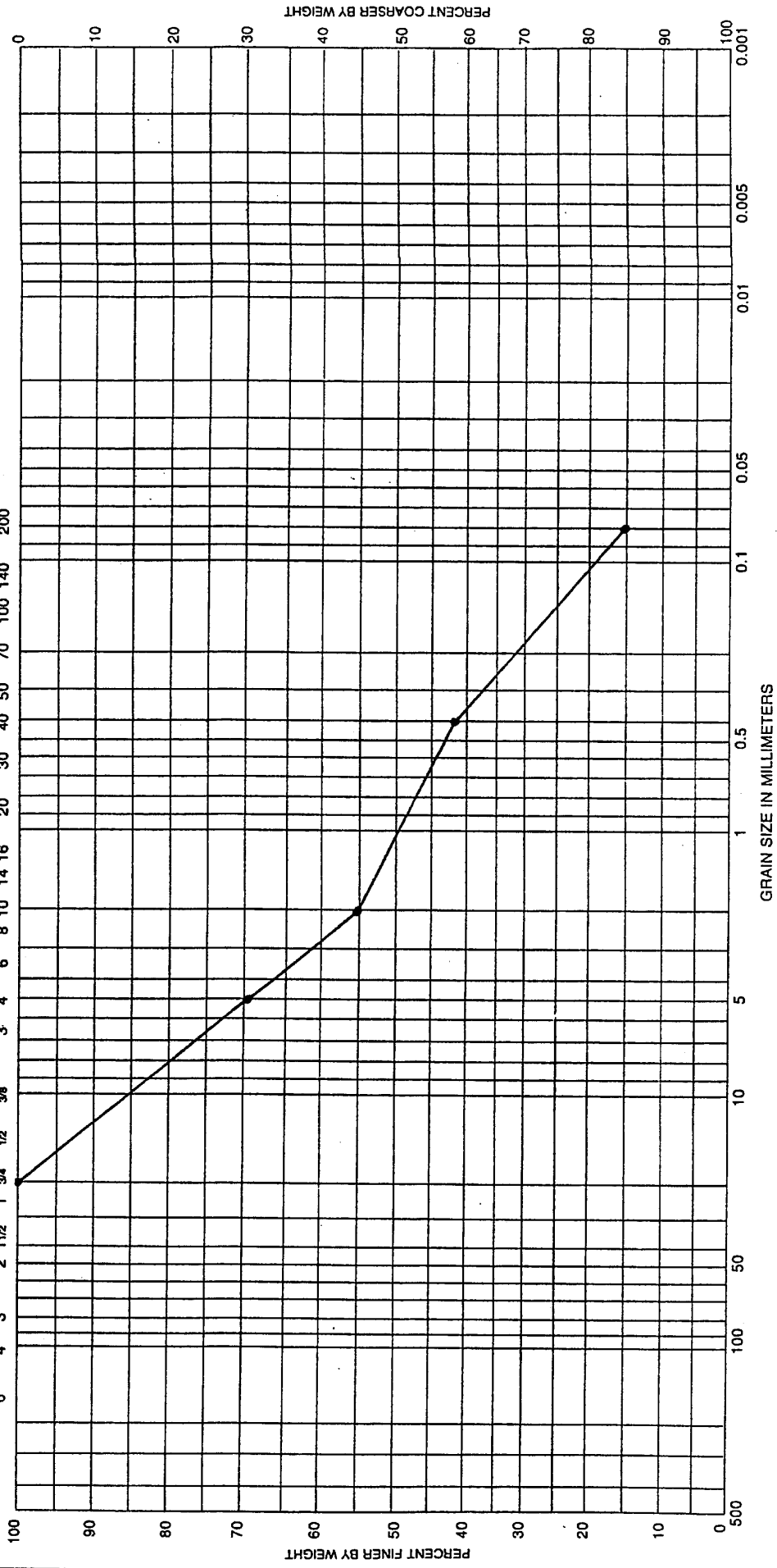
Project Amarillo MSWLF



HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

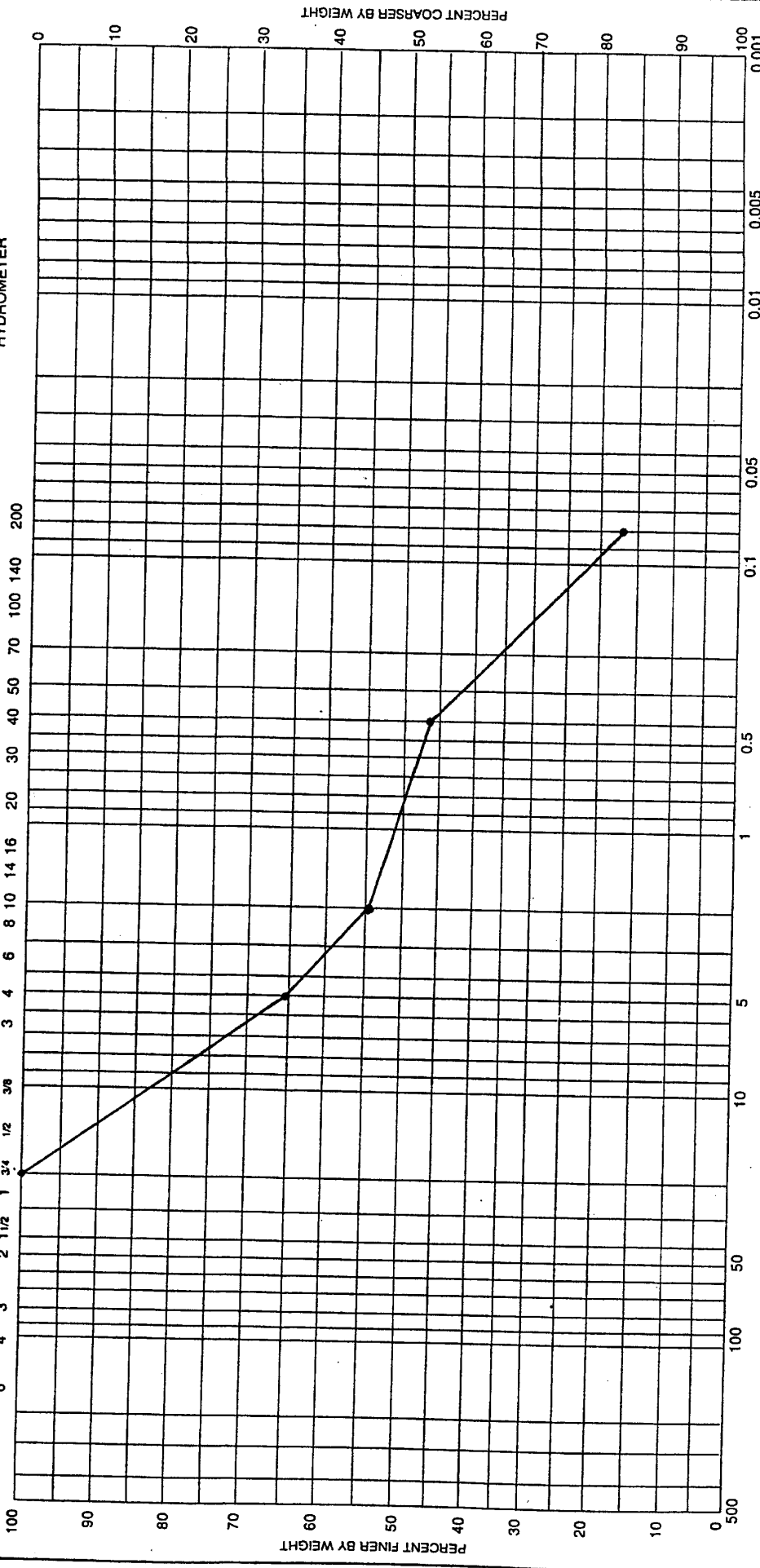


	COBBLES	GRAVEL	SAND	SILT OR CLAY	
	COARSE	FINE	NEUTRAL	FINE	
Sample No.	Classification				PI
PZ-3-15	Clayey Sand: Reddish Tan With Calcareous Nodules (SC)				NP
Elev or Depth					Area
130'					Boring No.
					PZ-3
					Date
					8-22-94
GRADATION CURVES					

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER



Sample No.	Elev or Depth	Classification	GRAVEL			SAND			SILT OR CLAY		
			COARSE	FINE		NEUTRAL	FINE				
PZ-3-16	140'	Clayey Sand: Reddish Tan With Pea Gravel (SC)				Net w %	LL	PL	PI	Project	Amarillo MSWLF
							26	22	4	Area	
										Boring No.	PZ-3
										Date	8-22-94

GRADATION CURVES

APPENDIX B

ORGANIC CARBON CONTENT TEST RESULTS



# City of Amarillo

September 30, 1994

Troy Hotchkiss  
HDR Engineering  
Dallas, TX

Mr. Hotchkiss:

Soil samples for Total Organic Carbon at the City of Amarillo Landfill are now complete. There were a total of thirty four samples delivered between 7/7/94 and 8/18/94 by Dyess-Peterson Testing Laboratory of Amarillo. These samples originate from drilling operations for monitoring wells at the landfill.

Results are expressed as mg/kg dry wt TOC (Total Organic Carbon). Dt. Limit 0.01 mg/kg.

SAMPLE #	SAMPLE DATE	DESCRIPTION	TOC MG/KG
1-2080	07/07/94	TB-1 - 215'	257.32
2-2080	07/07/94	TB-1 - 225'	523.32
3-2080	07/07/94	TB-1 - 235'	741.97
4-2080	07/07/94	TB-1 - 245'	491.65
5-2080	07/07/94	TB-1 - 255'	1155.23
6-2080	07/08/94	TB-1 - 270'	225.22
7-2080	07/08/94	TB-1 - 280'	310.35
8-2080	07/11/94	TB-2 - 125'	1141.73
9-2080	07/11/94	TB-2 - 145'	343.77
10-2080	07/11/94	MW-6 - 155'	287.51
11-2080	07/12/94	TB-2 - 85'	1044.53
12-2080	07/13/94	TB-2 - 95'	313.52
13-2080	07/13/94	TB-2 - 105'	258.68
14-2080	07/14/94	TB-2 - 125'	271.65
15-2080	07/14/94	TB-2 - 145'	343.71
16-2080	07/14/94	TB-2 - 165'	605.70
17-2080	07/14/94	TB-2 - 180'	373.89



18-2080	07/19/94	MW-2 - 170'	237.10
19-2080	07/19/94	MW-2 - 190'	444.12
20-2080	07/19/94	MW-2 - 210'	482.80
21-2080	07/19/94	MW-2 - 230'	336.34
22-2080	07/19/94	MW-2 - 245'	529.70
23-2080	07/22/94	MW-3 - 90'	689.40
24-2080	07/22/94	MW-3 - 110'	354.10
25-2080	07/22/94	MW-3 - 130'	224.10
26-2080	07/22/94	MW-3 - 150'	288.75
27-2080	07/25/94	MW-3 - 180'	373.96
28-2080	07/25/94	MW-3 - 210'	291.54
29-2080	07/25/94	MW-3 - 230'	382.33
30-2080	07/25/94	MW-3 - 245'	273.89
31-2080	08/17/94	MW-6 - 160'	4329.00
32-2080	08/18/94	MW-6 - 170'	369.46
33-2080	08/18/94	MW-6 - 180'	12843.07
34-2080	08/18/94	MW-1 - 200'	1379.94

The elevated readings of samples 31, 33 & 34 were re-checked and found to be correct.

Methods: EPA offers Method 9060 "Total Organic Carbon" for liquids or wet slurries which can be injected as a liquid - no mention of dry soils! Rosemount (Dohrmann) who manufactured the carbon analyzer offer application method TOC-011 "Analysis of Sludges and Solids for Carbon". Inclusive to this method is TOC (Total Organic Carbon). This is the method we used.

If there are any questions concerning this report, please call anytime at 806-372-4531.

*David Reasoner*

David Reasoner  
Environmental Chemist

DR:lb

ccs: Lee Peterson  
Mike Kennedy  
Dan Coffey  
Ron Freeman

APPENDIX C

**SUMMARY OF PERMEABILITY TESTS**

APPENDIX D

**TWC MONITOR WELL DATA SHEET**

# A. Monitor Well Data Sheet

Texas Water Commission  
Municipal Solid Waste Division  
SE 67

Committee or Site Name: City of Amarillo MSWLF  
County: Potter

TDH Permit No.: 73

Monitor Well I.D. No.: PZ-1

Date of Monitor Well Installation: 8-2-94

Date of Monitor Well

Monitor Well: Latitude: N35° 13'15" Longitude: W102° 01'25"

Development: 8-4-94

Monitor Well Groundwater

Monitor Well Driller

Gradient: Upgradient  Downgradient

Name: Lee Peterson

License No.: 3045M

**NOTE:**

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Ray Hamby

Static Water Level Elevation (with respect to MSL) after Well Development: 3604.84'

Name of Geologic Formation(s) in which Well is completed: Ogallala

Type of Locking Device: Padlock

Type of Casing Protection: Upright Well Protector

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 6' X 6' X 6"

Surface Elevation: 3808.04'

Top of Protective Collar Elevation: 3812.61'

Top of Casing Elevation: 3812.31'

Surveyor's Pin Elevation: \_\_\_\_\_

Concrete Seal  
Depth: 0.0'

Casing Seal (Backfill)  
Material: Bentonite Grout

Bentonite Seal

Filter Pack

Filter Pack Material: 8-16 Sand  
Sterilized Sand or Glass Beads

Bentonite Seal Top  
Depth: 195' Elevation: 3613.04'

Filter Pack Top  
Depth: 200' Elevation: 3608.04'

Well Screen  
Top Depth: 205'  
Top Elevation: 3603.04'

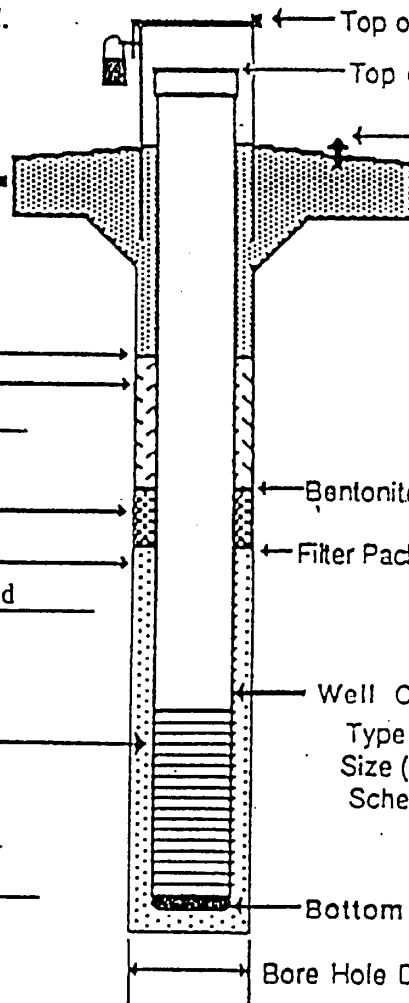
Well Casing  
Type: PVC  
Size (diameter): 4"  
Schedule or Thickness: Sch. 40

Type of Well Screen: PVC

Screen Opening Size:  
0.020"

Bottom Cap (Depth: 245')

Bore Hole Diameter: 9.875"



# A. Monitor Well Data Sheet

Texas Water Commission  
Municipal Solid Waste Division  
SE 67

Committee or Site Name: City of Amarillo MSWLF

County: Potter

Date of Monitor Well Installation: 7-30-94

Monitor Well: Latitude: N35° 13'32" Longitude: W102° 00'59"

Monitor Well Groundwater

Gradient: Upgradient  Downgradient

TDH Permit No.: 73

Monitor Well I.D. No.: PZ-2

Date of Monitor Well

Development: 8-1-94

Monitor Well Driller

Name: Lee Peterson

License No.: 3045M

## NOTE:

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.  
 (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.  
 (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".  
 (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.  
 (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Ray Hamby

Static Water Level Elevation (with respect to MSL) after Well Development: 3576.56'

Name of Geologic Formation(s) in which Well is completed: Ogallala

Type of Locking Device: Padlock

Type of Casing Protection: Upright Well Protector

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions:

6' X 6' X 6"

Surface Pad  
Elevation: 3793.86'

Concrete Seal

Depth: 0.0

Casing Seal (Backfill)

Material: Bentonite Grout

Bentonite Seal

Filter Pack

Filter Pack Material: 8-16 Sand

Sterilized Sand or Glass Beads

Well Screen

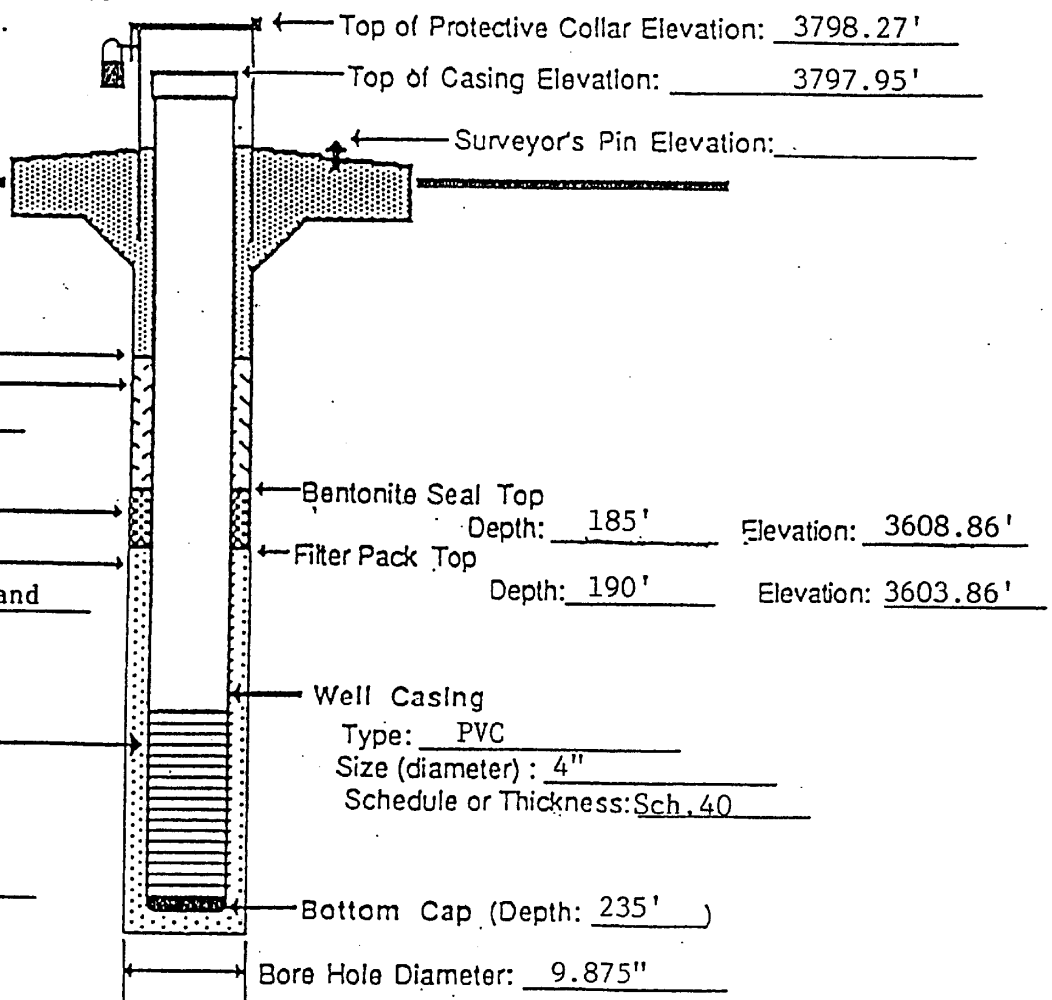
Top Depth: 195'

Top Elevation: 3598.86'

Type of Well Screen: PVC

Screen Opening Size:

0.020"



# A. Monitor Well Data Sheet

Texas Water Commission  
Municipal Solid Waste Division  
SE 67

Committee or Site Name: City of Amarillo MSWLF  
 County: Potter  
 Date of Monitor Well Installation: 8-24-94  
 Monitor Well: Latitude: N35° 13'57" Longitude: W102° 01'08"  
 Monitor Well Groundwater  
 Gradient: Upgradient XX Downgradient     

TDH Permit No.: 73  
 Monitor Well I.D. No.: PZ-3  
 Date of Monitor Well  
 Development: 8-26-94  
 Monitor Well Driller  
 Name: Lee Peterson  
 License No.: 3045M

**NOTE:**

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Ray Hamby

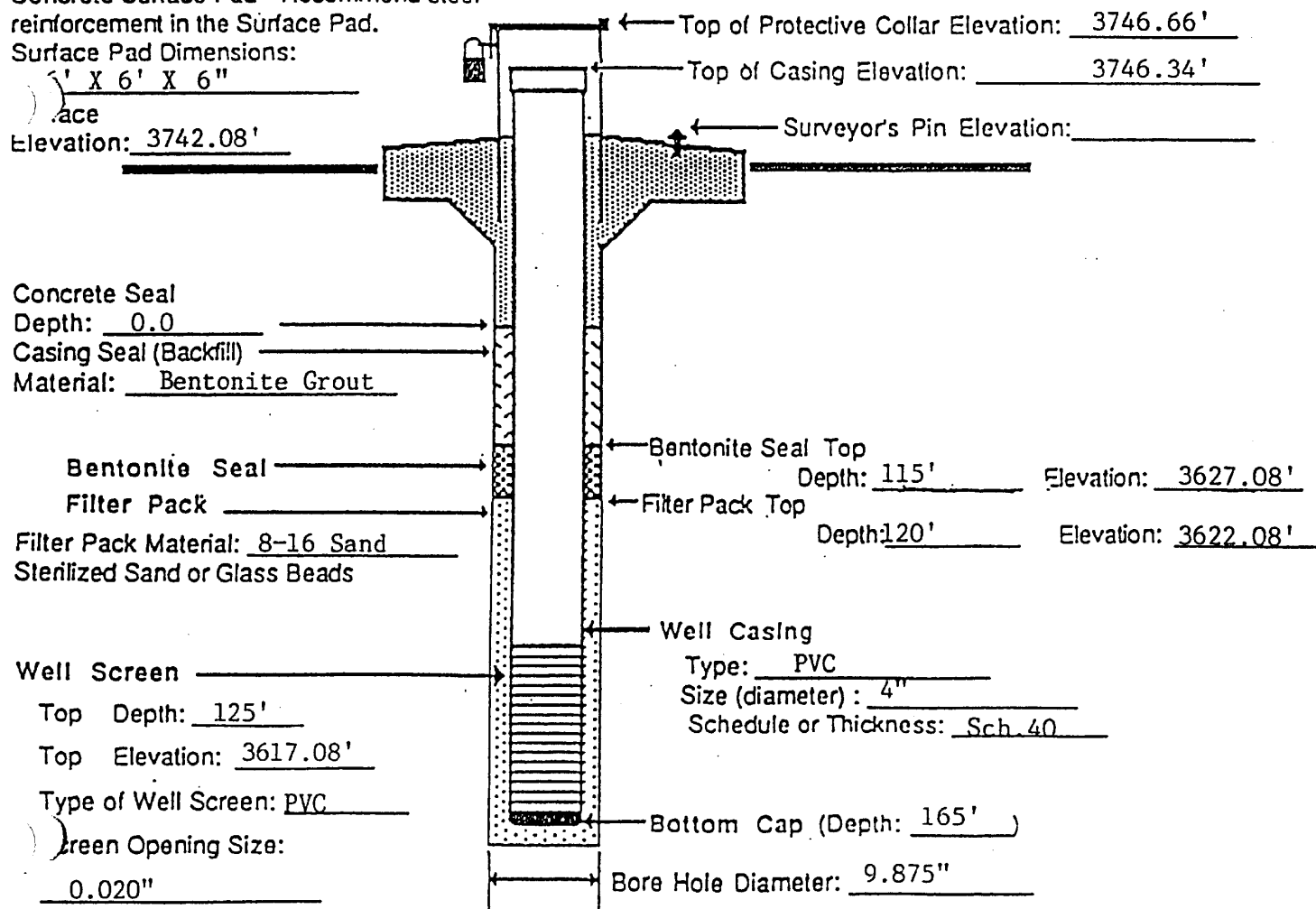
Static Water Level Elevation (with respect to MSL) after Well Development: 3593.28'

Name of Geologic Formation(s) in which Well is completed: Ogallala

Type of Locking Device: Padlock Type of Casing Protection: Upright Well Protector

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions:  
6' X 6' X 6"  
 Surface Elevation: 3742.08'



Concrete Seal  
 Depth: 0.0  
 Casing Seal (Backfill)  
 Material: Bentonite Grout

Bentonite Seal  
 Depth: 115' Elevation: 3627.08'

Filter Pack  
 Filter Pack Material: 8-16 Sand  
 Sterilized Sand or Glass Beads  
 Depth: 120' Elevation: 3622.08'

Well Screen  
 Type: PVC  
 Size (diameter): 4"  
 Schedule or Thickness: Sch. 40

Top Depth: 125'  
 Top Elevation: 3617.08'

Type of Well Screen: PVC

Screen Opening Size:  
0.020"

Bottom Cap (Depth: 165')

Bore Hole Diameter: 9.875"

# A. Monitor Well Data Sheet

Texas Water Commission  
Municipal Solid Waste Division  
SE 67

Committee or Site Name: City of Amarillo MSWLF

TDH Permit No.: 73

County: Potter

Monitor Well I.D. No.: MW-1

Date of Monitor Well Installation: 8-9-94

Date of Monitor Well

Monitor Well: Latitude: N35° 13'16" Longitude: W102° 01'35"

Development: 8-10-94

Monitor Well Groundwater

Monitor Well Driller

Gradient: Upgradient  Downgradient

Name: Lee Peterson

License No.: 3045M

**NOTE:**

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Ray Hamby

Static Water Level Elevation (with respect to MSL) after Well Development: 3588.30'

Name of Geologic Formation(s) in which Well is completed: Ogallala

Type of Locking Device: Padlock Type of Casing Protection: Upright Well Protector

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions:

6' X 6' X 6"

Surface Pad Elevation: 3814.85'

Surface Pad Elevation: 3814.85'

Concrete Seal

Depth: 0.0

Casing Seal (Backfill)

Material: Bentonite Grout

Bentonite Seal

Filter Pack

Filter Pack Material: 8-16 Sand

Sterilized Sand or Glass Beads

Well Screen

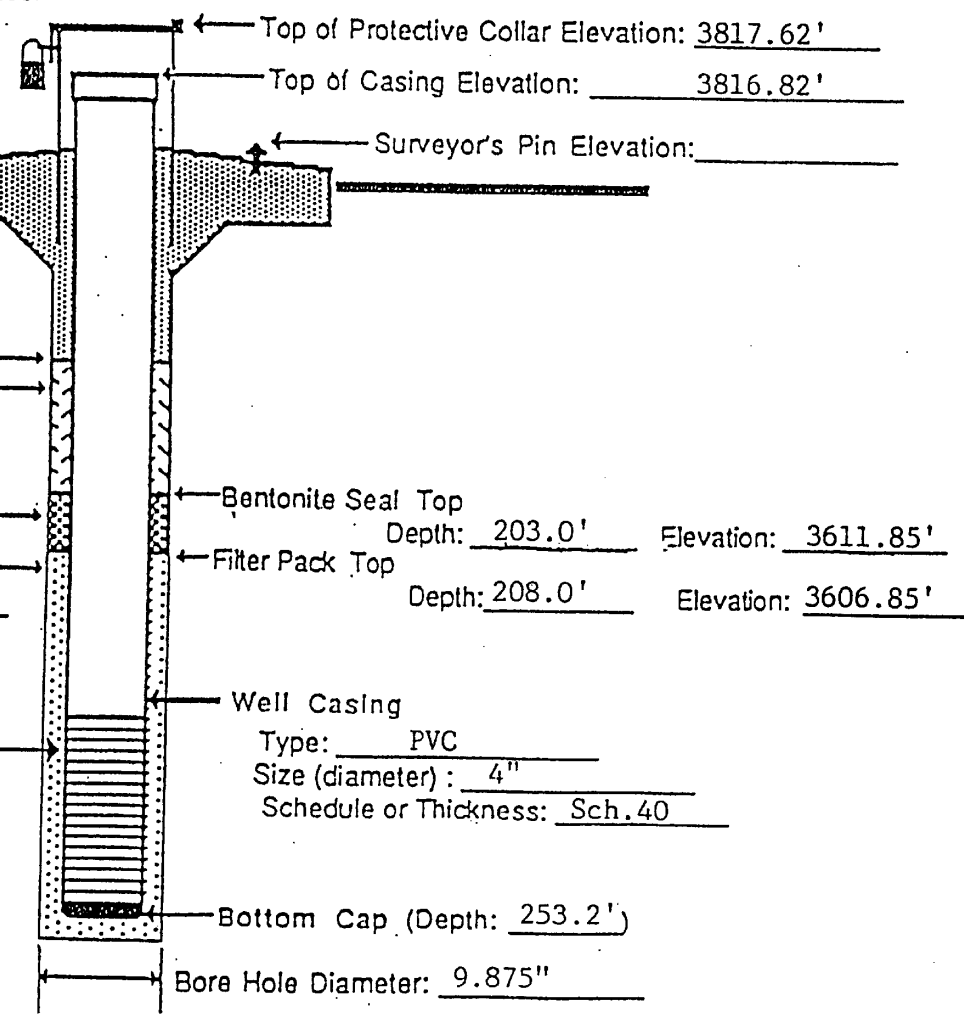
Top Depth: 213.0'

Top Elevation: 3601.85'

Type of Well Screen: PVC

Well Screen Opening Size:

0.020"



# A. Monitor Well Data Sheet

Texas Water Commission  
Municipal Solid Waste Division  
SE 67

Committee or Site Name: City of Amarillo MSWLF

TDH Permit No.: 73

County: Potter

Monitor Well I.D. No.: MW-2

Date of Monitor Well Installation: 7-20-94

Date of Monitor Well

Monitor Well: Latitude: N35° 13'15" Longitude: W102° 01'12"

Development: 7-21-94

Monitor Well Groundwater

Monitor Well Driller

Gradient: Upgradient  Downgradient

Name: Lee Peterson

License No.: 3045M

**NOTE:**

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Ray Hamby

Static Water Level Elevation (with respect to MSL) after Well Development: 3586.29'

Name of Geologic Formation(s) in which Well is completed: Ogallala

Type of Locking Device: Padlock Type of Casing Protection: Upright Well Protector

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 6' X 6' X 6"

Surface Elevation: 3805.39'

Concrete Seal  
Depth: 0.0

Casing Seal (Backfill)  
Material: Bentonite Grout

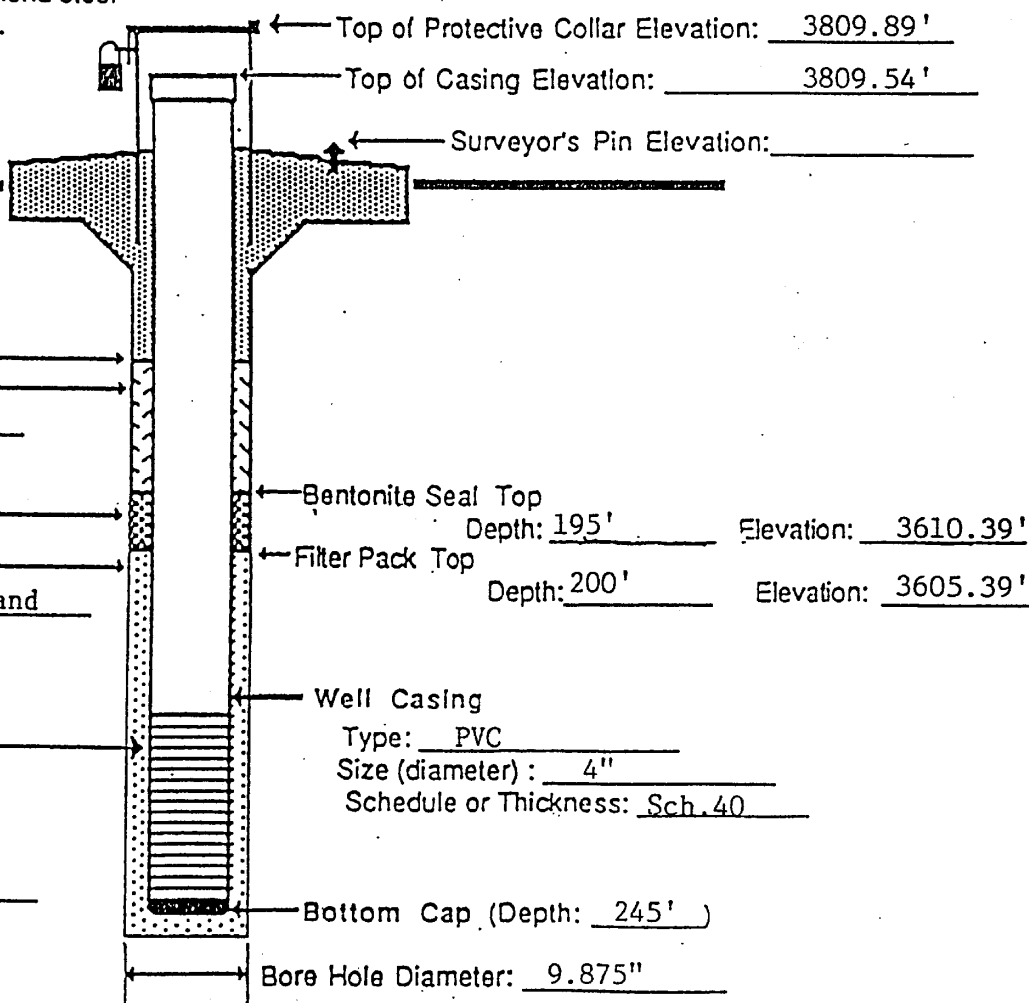
Bentonite Seal  
Depth: 195' Elevation: 3610.39'

Filter Pack  
Filter Pack Material: 8-16 Sand  
Sterilized Sand or Glass Beads  
Depth: 200' Elevation: 3605.39'

Well Screen  
Top Depth: 205'  
Top Elevation: 3600.39'

Type of Well Screen: PVC

Well Screen Opening Size: 0.020"





# A. Monitor Well Data Sheet

Texas Water Commission  
Municipal Solid Waste Division  
SE 67

Committee or Site Name: City of Amarillo MSWLF

County: Potter

Date of Monitor Well Installation: 7-20-94

Monitor Well: Latitude: N35° 13'16" Longitude: W102° 00'35"

Monitor Well Groundwater

Gradient: Upgradient  Downgradient  XX

TDH Permit No.: 73

Monitor Well I.D. No.: MW-3

Date of Monitor Well

Development: 7-23-94

Monitor Well Driller

Name: Lee Peterson

License No.: 3045M

**NOTE:**

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Ray Hamby

Static Water Level Elevation (with respect to MSL) after Well Development: 3589.92'

Name of Geologic Formation(s) in which Well is completed: Ogallala

Type of Locking Device: Padlock

Type of Casing Protection: Upright Well Protector

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions:

6' X 6' X 6"

Surface Elevation: 3789.57'

Concrete Seal

Depth: 0.0

Casing Seal (Backfill)

Material: Bentonite Grout

Bentonite Seal

Filter Pack

Filter Pack Material: 8-16 Sand

Sterilized Sand or Glass Beads

Well Screen

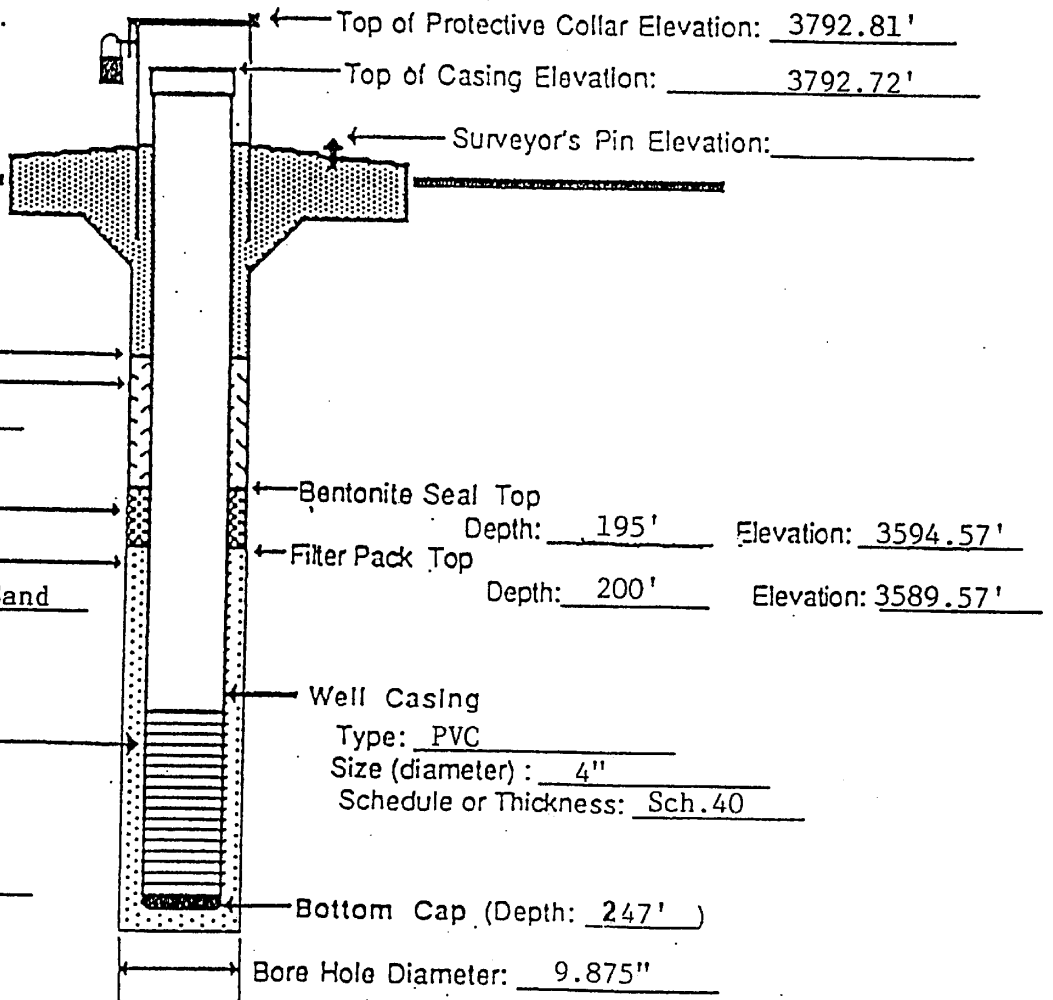
Top Depth: 207'

Top Elevation: 3582.57'

Type of Well Screen: PVC

Screen Opening Size:

0.020"



Top of Protective Collar Elevation: 3792.81'

Top of Casing Elevation: 3792.72'

Surveyor's Pin Elevation: \_\_\_\_\_

Bentonite Seal Top  
Depth: 195' Elevation: 3594.57'

Filter Pack Top  
Depth: 200' Elevation: 3589.57'

Well Casing

Type: PVC

Size (diameter): 4"

Schedule or Thickness: Sch. 40

Bottom Cap (Depth: 247')

Bore Hole Diameter: 9.875"

# A. Monitor Well Data Sheet

Committee or Site Name: City of Amarillo MSWLF

TDH Permit No.: 73

County: Potter

Monitor Well I.D. No.: MW-4

Date of Monitor Well Installation: 8-17-94

Date of Monitor Well

Monitor Well: Latitude: N35° 13'41" Longitude: W102° 00'35"

Development: 8-19-94

Monitor Well Groundwater

Monitor Well Driller

Gradient: Upgradient  Downgradient

Name: Lee Peterson

License No.: 3045M

**NOTE:**

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Ray Hamby

Static Water Level Elevation (with respect to MSL) after Well Development: 3593.18'

Name of Geologic Formation(s) in which Well is completed: Ogallala

Type of Locking Device: Padlock

Type of Casing Protection: Upright Well Protector

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 6' X 6' X 6"

Surface Elevation: 3746.88'

Concrete Seal  
Depth: 0.0

Casing Seal (Backfill)  
Material: Bentonite Grout

Bentonite Seal

Filter Pack

Filter Pack Material: 8-16 Sand  
Sterilized Sand or Glass Beads

Well Screen

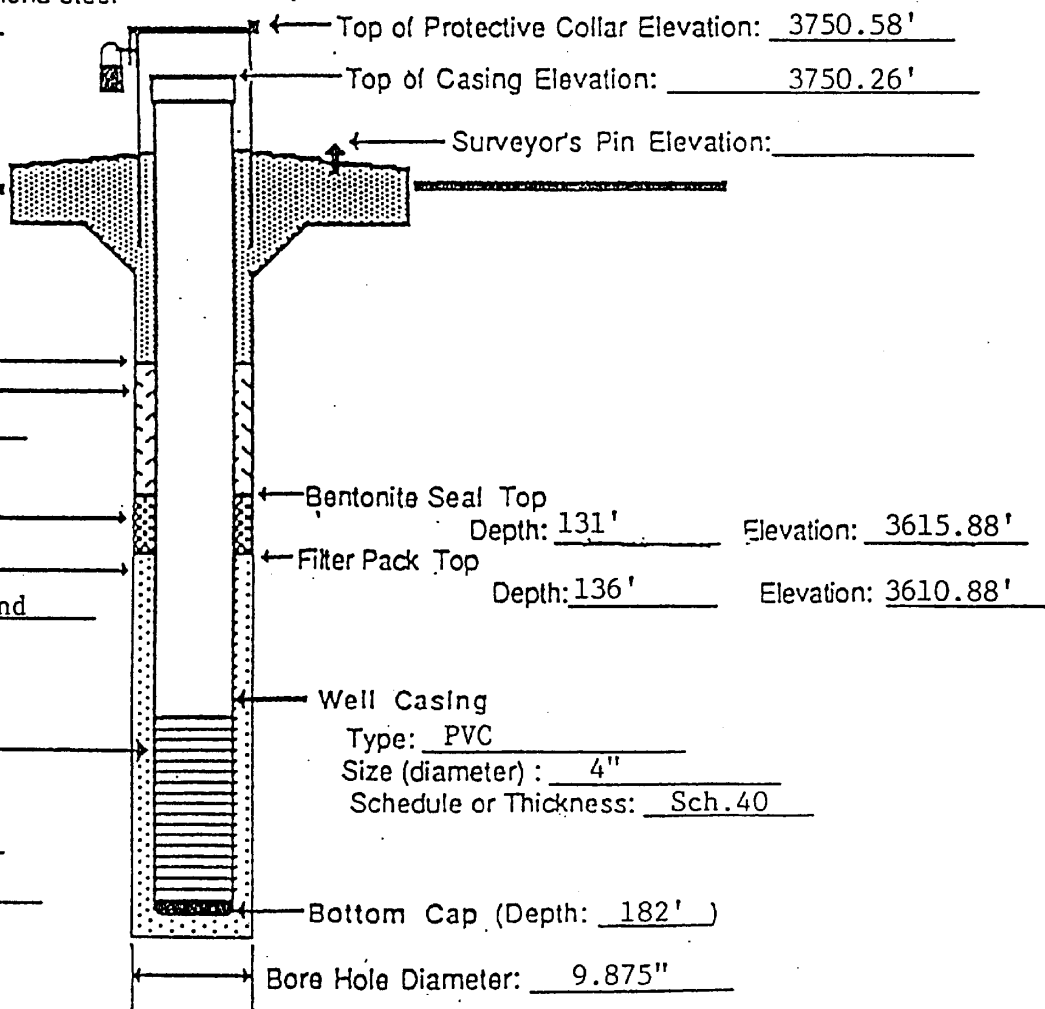
Top Depth: 142'

Top Elevation: 3604.88'

Type of Well Screen: PVC

Screen Opening Size:

0.020"



Top of Protective Collar Elevation: 3750.58'

Top of Casing Elevation: 3750.26'

Surveyor's Pin Elevation: \_\_\_\_\_

Bentonite Seal Top  
Depth: 131' Elevation: 3615.88'

Filter Pack Top  
Depth: 136' Elevation: 3610.88'

Well Casing  
Type: PVC  
Size (diameter): 4"  
Schedule or Thickness: Sch. 40

Bottom Cap (Depth: 182')

Bore Hole Diameter: 9.875"

# A. Monitor Well Data Sheet

Permittee or Site Name: City of Amarillo MSWLF

County: Potter

Date of Monitor Well Installation: 8-20-94

Monitor Well: Latitude: N35° 14'09" Longitude: W102° 00'44"

Monitor Well Groundwater

Gradient: Upgradient XX Downgradient    

TDH Permit No.: 73

Monitor Well I.D. No.: MW-5

Date of Monitor Well

Development: 8-22-94

Monitor Well Driller

Name: Lee Peterson

License No.: 3045M

**NOTE:**

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Ray Hamby

Static Water Level Elevation (with respect to MSL) after Well Development: 3610.14'

Name of Geologic Formation(s) in which Well is completed: Ogallala

Type of Locking Device: Padlock

Type of Casing Protection: Upright Well Protector

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions: 6' X 6' X 6"

Surface Elevation: 3736.64'

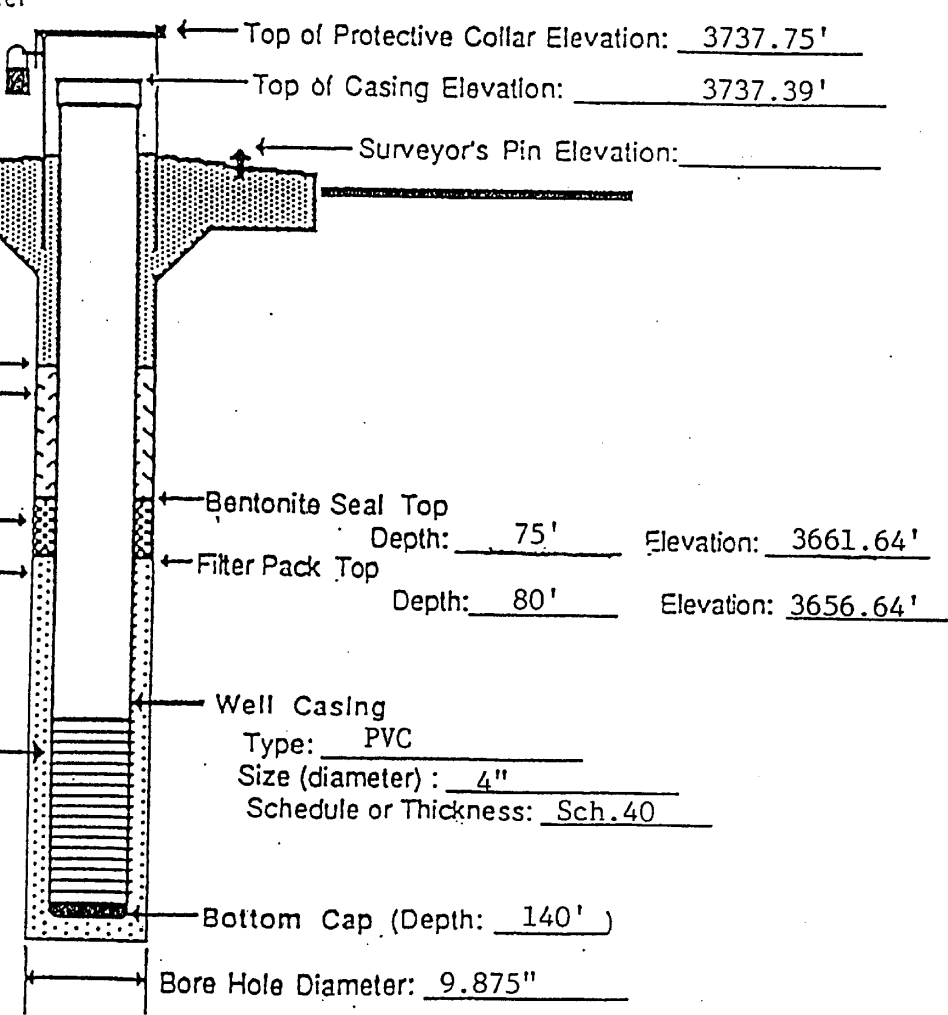
Concrete Seal  
Depth: 0.0

Casing Seal (Backfill)  
Material: Bentonite Grout

Bentonite Seal  
Filter Pack

Filter Pack Material: 8-16 Sand  
Sterilized Sand or Glass Beads

Well Screen  
Top Depth: 85'  
Top Elevation: 3651.64'  
Type of Well Screen: PVC  
Screen Opening Size: 0.020"



Top of Protective Collar Elevation: 3737.75'

Top of Casing Elevation: 3737.39'

Surveyor's Pin Elevation:                     

Bentonite Seal Top  
Depth: 75' Elevation: 3661.64'

Filter Pack Top  
Depth: 80' Elevation: 3656.64'

Well Casing  
Type: PVC  
Size (diameter): 4"  
Schedule or Thickness: Sch. 40

Bottom Cap (Depth: 140')

Bore Hole Diameter: 9.875"

# A. Monitor Well Data Sheet

Texas Water Commission  
Municipal Solid Waste Division  
SE 67

Committee or Site Name: City of Amarillo MSWLF

TDH Permit No.: 73

County: Potter

Monitor Well I.D. No.: MW-6

Date of Monitor Well Installation: 8-18-94

Date of Monitor Well

Monitor Well: Latitude: N35° 14'07" Longitude: W102° 01'23"

Development: 8-19-94

Monitor Well Groundwater

Monitor Well Driller

Gradient: Upgradient  Downgradient

Name: Lee Peterson

License No.: 3045M

**NOTE:**

- (A) The information shown in the sketch below should be considered the minimum required for an installed ground-water monitor well.
- (B) Report All Depths from Surface Elevation and all Elevations relative to Mean Sea Level.
- (C) The minimum distance between the inside wall of the Bore Hole and the outside of the Well Casing shall be 3".
- (D) Use Flush Screw Joint Casing only, 2" diameter or larger. Recommend 4" diameter minimum & Teflon Taping Casing Joints.
- (E) Well development should continue until water is clear, and pH and conductivity are stable.

Geologist, Hydrologist or Engineer Supervising Well Installation: Ray Hamby

Static Water Level Elevation (with respect to MSL) after Well Development: 3597.53'

Name of Geologic Formation(s) in which Well is completed: Ogallala

Type of Locking Device: Padlock

Type of Casing Protection: Upright Well Protector

Concrete Surface Pad - Recommend steel reinforcement in the Surface Pad.

Surface Pad Dimensions:

6' X 6' X 6"

Surface Elevation: 3746.38'

Top of Protective Collar Elevation: 3750.72'

Top of Casing Elevation: 3750.40'

Surveyor's Pin Elevation: \_\_\_\_\_

Concrete Seal

Depth: 0.0

Casing Seal (Backfill)

Material: Bentonite Grout

Bentonite Seal

Filter Pack

Filter Pack Material: 8-16 Sand

Sterilized Sand or Glass Beads

Bentonite Seal Top

Depth: 124'

Elevation: 3622.38'

Filter Pack Top

Depth: 129'

Elevation: 3617.38'

Well Casing

Type: PVC

Size (diameter): 4"

Schedule or Thickness: Sch. 40

Well Screen

Top Depth: 136'

Top Elevation: 3610.38'

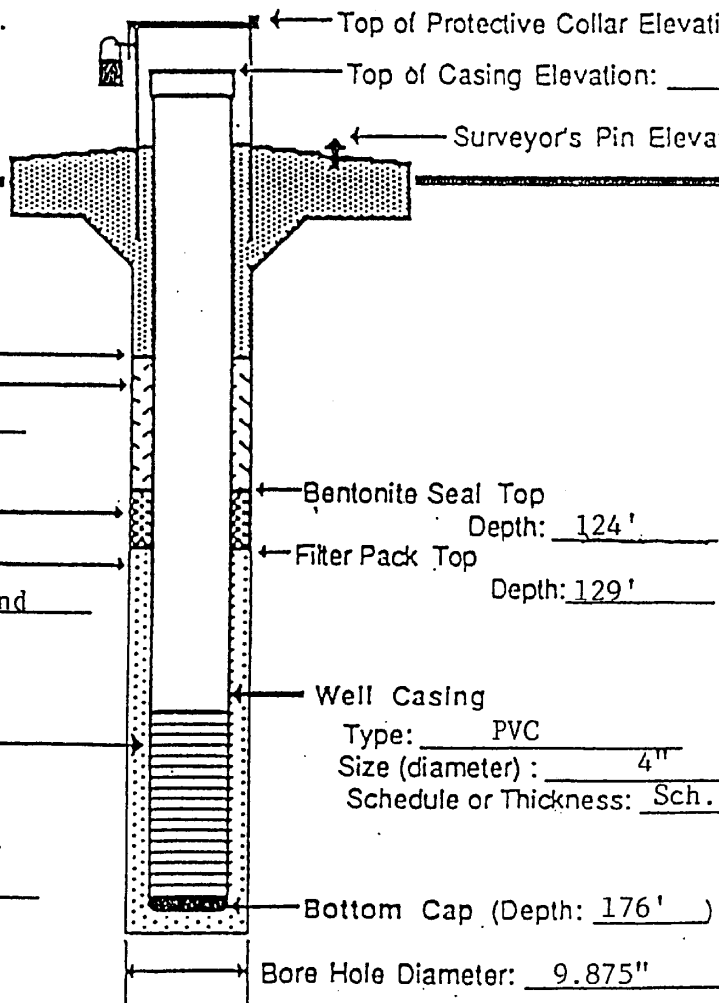
Type of Well Screen: PVC

Screen Opening Size:

0.020"

Bottom Cap (Depth: 176')

Bore Hole Diameter: 9.875"



APPENDIX E

TNRCC MONITOR WELL LOGS

ATTENTION OWNER: *Confidentiality Privilege Notice on Reverse Side* TB-1 State of Texas WELL REPORT Texas Water Well Drillers Board  
P.O. Box 13087  
Austin, Texas 78711

OWNER City of Amarillo ADDRESS P O Box 1971 Amarillo, Texas 79186  
(Name) (Street or RFD) (City) (State) (Zip)

LOCATION OF WELL: County Potter 10 miles in West direction from Amarillo  
(NE, SW, etc.) (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

LEGAL DESCRIPTION: Section No. 126 Block No. 6 Township Amarillo County Potter Abstract No. Potter Survey Name B S & F  
 Distance and direction from two intersecting section or survey lines \_\_\_\_\_

SEE ATTACHED MAP

3) TYPE OF WORK (Check):  New Well  Deepening  Reconditioning  Plugging

4) PROPOSED USE (Check):  Boring  Domestic  Industrial  Monitor  Public Supply  Irrigation  Test Well  Injection  De-Watering

5) DRILLING METHOD (Check):  Driven  Mud Rotary  Air Hammer  Jetted  Bored  Air Rotary  Cable Tool  Other \_\_\_\_\_

6) WELL LOG: Date Drilling: Started 7-5 19 94 Completed 7-9 19 94

Diameter of Hole	Diameter of Hole	
	Dia. (in.)	From (ft.) To (ft.)
5	Surface	280

7) BOREHOLE COMPLETION:  Open Hole  Straight Wall  Underreamed  Gravel Packed  Other \_\_\_\_\_  
 If Gravel Packed give interval ... from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

From (ft.)	To (ft.)	Description and color of formation material	Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Casting Screen
						From	To	
0'	3'	Dark Brown Sandy Clay						
3'	5'	Reddish Brown Sandy Clay						
5'	60'	Reddish Tan Sandy Clay w/ Calcareous Nodules						
60'	70'	Reddish Tan Clayey Sand w/ Calcareous Nodules						
70'	85'	Caliche						
85'	185'	Reddish Tan Clayey Sand w/ Calcareous Nodules						
185'	205'	Tan Sand (well-sorted) Fine Grain (Over) <small>(Use reverse side if necessary)</small>						

8) CASING, BLANK PIPE, AND WELL SCREEN DATA:

9) CEMENTING DATA [Rule 287.44(1)]  
 Cemented from 0 ft. to 280 ft. No. of Sacks Used 36  
 \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Sacks Used \_\_\_\_\_  
 Method used Tremie  
 Cemented by Peterson Drilling & Testing, Inc.

10) SURFACE COMPLETION  
 Specified Surface Slab Installed [Rule 287.44(2)(A)]  
 Specified Steel Sleeve Installed [Rule 287.44(3)(A)]  
 Pitless Adapter Used [Rule 287.44(3)(B)]  
 Approved Alternative Procedure Used [Rule 287.71]

11) WATER LEVEL:  
 Static level N/A ft. below land surface Date \_\_\_\_\_  
 Artesian flow \_\_\_\_\_ gpm. Date \_\_\_\_\_

12) PACKERS: Type \_\_\_\_\_ Depth \_\_\_\_\_  
N/A

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Peterson Drilling & Testing, Inc. WELL DRILLER'S LICENSE NO. 3045M  
(Type or print)

As Rt 7 Box 636 Amarillo, Texas 79186  
(Street or RFD) (City) (State) (Zip)

(Signed) [Signature] (Signed) [Signature]  
(Licensed Well Driller) (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available. For TWC use only: Well No. \_\_\_\_\_ Located on map \_\_\_\_\_



ATTENTION OWNER: Confidentiality  
Privilege Notice on Reverse Side

State of Texas  
WELL REPORT

Texas Water Well Drillers Board  
P.O. Box 13087  
Austin, Texas 78711

TB-2

OWNER City of Amarillo ADDRESS P O Box 1971 Amarillo, Texas 79186  
(Name) (Street or RFD) (City) (State) (Zip)

LOCATION OF WELL:  
County Potter 10 miles in West direction from Amarillo  
(NE, SW, etc.) (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

LEGAL DESCRIPTION: Section No. 126 Block No. 6 Township Amarillo County Potter Survey Name B S & F

Distance and direction from two intersecting section or survey lines \_\_\_\_\_

SEE ATTACHED MAP

3) TYPE OF WORK (Check):  New Well  Deepening  Reconditioning  Plugging

4) PROPOSED USE (Check):  Boring  Domestic  Industrial  Monitor  Public Supply  Irrigation  Test Well  Injection  De-Watering

5) DRILLING METHOD (Check):  Driven  Mud Rotary  Air Hammer  Jetted  Bored  Air Rotary  Cable Tool  Other \_\_\_\_\_

6) WELL LOG:  
Date Drilling: \_\_\_\_\_  
Started 7-12 1994  
Completed 7-15 1994

DIAMETER OF HOLE		
Dia. (in.)	From (ft.)	To (ft.)
5	Surface	180

7) BOREHOLE COMPLETION:  
 Open Hole  Straight Wall  Underreamed  
 Gravel Packed  Other N/A  
If Gravel Packed give interval ... from \_\_\_\_\_ ft. to \_\_\_\_\_ ft.

From (ft.)	To (ft.)	Description and color of formation material
0'	10'	Tan Sand (well-sorted)
10'	25'	Caliche Cap
25'	75'	Reddish Tan Clayey Sand w/ Caliche Nodules
75'	80'	Reddish Brown Clayey Sand w/ Caliche Nodules
80'	95'	Reddish Tan Clayey Sand w/ Pea Gravel
95'	100'	Red to Green Silty Clay
105'	115'	Light Green Silty Clay

(Use reverse side if necessary)

8) CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Casting Screen
			From	To	

13) TYPE PUMP:  
 Turbine  Jet  Submersible  Cylinder  
 Other N/A  
Depth to pump bowls, cylinder, jet, etc., \_\_\_\_\_ ft.

14) WELL TESTS:  
Type Test:  Pump  Baller  Jetted  Estimated  
Yield: \_\_\_\_\_ gpm with \_\_\_\_\_ ft. drawdown after \_\_\_\_\_ hrs.

15) WATER QUALITY:  
Did you knowingly penetrate any strata which contained undesirable constituents?  
 Yes  No If yes, submit "REPORT OF UNDESIRABLE WATER"  
Type of water? \_\_\_\_\_ Depth of strata \_\_\_\_\_  
Was a chemical analysis made?  Yes  No

9) CEMENTING DATA [Rule 287.44(1)]  
Cemented from 0 ft. to 180 ft. No. of Sacks Used 26  
\_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Sacks Used \_\_\_\_\_  
Method used Tremie  
Cemented by Peterson Drilling & Testing, Inc.

10) SURFACE COMPLETION  
 Specified Surface Slab Installed [Rule 287.44(2)(A)]  
 Specified Steel Sleeve Installed [Rule 287.44(3)(A)]  
 Pitless Adapter Used [Rule 287.44(3)(B)]  
 Approved Alternative Procedure Used [Rule 287.71]

11) WATER LEVEL:  
Static level N/A ft. below land surface Date \_\_\_\_\_  
Artesian flow \_\_\_\_\_ gpm. Date \_\_\_\_\_

12) PACKERS: Type \_\_\_\_\_ Depth \_\_\_\_\_  
N/A

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Peterson Drilling & Testing, Inc. WELL DRILLER'S LICENSE NO. 3045M  
(Type or print)

17 Box 636 Amarillo, Texas 79118  
(Street or RFD) (City) (State) (Zip)  
(Signed) [Signature] (Signed) [Signature]  
(Licensed Well Driller) (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available. For TWC use only: Well No. \_\_\_\_\_ Located on map \_\_\_\_\_





ATTENTION OWNER: Confidentially  
Privilege Notice on Reverse Side

MW-1

State of Texas  
WELL REPORT

Texas Water Well Drillers Board  
P.O. Box 13087  
Austin, Texas 78711

OWNER City of Amarillo ADDRESS P O Box 1971 Amarillo, Texas 79186  
(Name) (Street or RFD) (City) (State) (Zip)

LOCATION OF WELL: County Potter 10 miles in West direction from Amarillo  
(NE, SW, etc.) (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

LEGAL DESCRIPTION: County Amarillo  
Section No. 126 Block No. 6 Township Amarillo ~~Range~~ No. Potter Survey Name B S & F

Distance and direction from two intersecting section or survey lines \_\_\_\_\_

SEE ATTACHED MAP

3) TYPE OF WORK (Check): <input checked="" type="checkbox"/> New Well <input type="checkbox"/> Deepening <input type="checkbox"/> Reconditioning <input type="checkbox"/> Plugging	4) PROPOSED USE (Check): <input type="checkbox"/> Domestic <input type="checkbox"/> Industrial <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Public Supply <input type="checkbox"/> Irrigation <input type="checkbox"/> Test Well <input type="checkbox"/> Injection <input type="checkbox"/> De-Watering	5) DRILLING METHOD (Check): <input type="checkbox"/> Driven <input checked="" type="checkbox"/> Mud Rotary <input type="checkbox"/> Air Hammer <input type="checkbox"/> Jetted <input type="checkbox"/> Bored <input type="checkbox"/> Air Rotary <input type="checkbox"/> Cable Tool <input type="checkbox"/> Other _____
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6) WELL LOG: Date Drilling: Started <u>8-4</u> 19 <u>94</u> Completed <u>8-9</u> 19 <u>94</u>	DIAMETER OF HOLE			7) BOREHOLE COMPLETION: <input type="checkbox"/> Open Hole <input type="checkbox"/> Straight Wall <input type="checkbox"/> Underreamed <input checked="" type="checkbox"/> Gravel Packed <input type="checkbox"/> Other _____ If Gravel Packed give interval ... from <u>208</u> ft. to <u>255</u> ft.
	Dia. (In.)	From (ft.)	To (ft.)	
	<u>9-7/8</u>	<u>Surface</u>	<u>255</u>	

From (ft.)	To (ft.)	Description and color of formation material	8) CASING, BLANK PIPE, AND WELL SCREEN DATA:				
			Dia. (In.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.) From To	Gage Casing Screen
0'	3'	Dark Brown Sandy Clay					
3'	18'	Reddish Tan Sandy Clay w/ Calcareous Nodules	4	New	Plastic (solid)	0 213	Sch 40
18'	25'	Light Tan Caliche	4	New	Plastic (perf)	213 253	.020
25'	65'	Reddish Tan Sandy Clay w/ Calcareous Nodules					
65'	73'	Light Tan Sandy Clay					
73'	205'	Reddish Tan Sandy Clay w/ Calcareous Nodules					
205'	253'	Tan Sand(well-sorted)w/ Cal. Nod <i>(Use reverse side if necessary)</i>					

13) TYPE PUMP:  
 Turbine  Jet  Submersible  Cylinder  
 Other N/A  
 Depth to pump bowls, cylinder, jet, etc., \_\_\_\_\_ ft.

14) WELL TESTS:  
 Type Test:  Pump  Baller  Jetted  Estimated  
 Yield: 3 gpm with 15 ft. drawdown after 1 hrs.

15) WATER QUALITY:  
 Did you knowingly penetrate any strata which contained undesirable constituents?  
 Yes  No If yes, submit "REPORT OF UNDESIRABLE WATER"  
 Type of water? perched Depth of strata 227.37  
 Was a chemical analysis made?  Yes  No

9) CEMENTING DATA [Rule 287.44(1)]  
 Cemented from 0 ft. to 203 ft. No. of Sacks Used 29  
 \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Sacks Used \_\_\_\_\_  
 Method used Tremie  
 Cemented by Peterson Drilling & Testing, Inc.

10) SURFACE COMPLETION  
 Specified Surface Slab Installed [Rule 287.44(2)(A)]  
 Specified Steel Sleeve Installed [Rule 287.44(3)(A)]  
 Pileless Adapter Used [Rule 287.44(3)(B)]  
 Approved Alternative Procedure Used [Rule 287.71]

11) WATER LEVEL:  
 Static level 227.37 ft. below land surface Date 8-12-94  
 Artesian flow \_\_\_\_\_ gpm. Date \_\_\_\_\_

12) PACKERS:  
 Type \_\_\_\_\_ Depth \_\_\_\_\_  
N/A

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Peterson Drilling & Testing, Inc. WELL DRILLER'S LICENSE NO. 3045M  
(Type or print)

ps Box 630 Amarillo, Texas 79186  
(Street or RFD) (City) (State) (Zip)  
(Signed) [Signature] (Signed) [Signature]  
(Licensed Well Driller) (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

For TWC use only: Well No. \_\_\_\_\_ Located on map \_\_\_\_\_



ATTENTION OWNER: Confidentially  
Privilege Notice on Reverse Side

MW-2

State of Texas  
WELL REPORT

Texas Water Well Drillers Board  
P.O. Box 13087  
Austin, Texas 78711

OWNER City of Amarillo ADDRESS PO Box 1971 Amarillo, Texas 79185  
(Name) (Street or RFD) (City) (State) (Zip)

LOCATION OF WELL: County Potter 10 miles in West direction from Amarillo  
(NE, SW, etc.) (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

LEGAL DESCRIPTION:

Section No. 126 Block No. 6 Township Potter Abstract No. \_\_\_\_\_ Survey Name B S & F

Distance and direction from two intersecting section or survey lines \_\_\_\_\_

SEE ATTACHED MAP

3) TYPE OF WORK (Check):

New Well  Deepening  
 Reconditioning  Plugging

4) PROPOSED USE (Check):

Domestic  Industrial  Monitor  Public Supply  
 Irrigation  Test Well  Injection  De-Watering

5) DRILLING METHOD (Check):

Mud Rotary  Air Hammer  Jetted  Bored  
 Air Rotary  Cable Tool  Other \_\_\_\_\_

6) WELL LOG:

Date Drilling: \_\_\_\_\_  
Started 7-15 1994  
Completed 7-20 1994

DIAMETER OF HOLE

Dia. (In.)	From (ft.)	To (ft.)
9-7/8	Surface	245

7) BOREHOLE COMPLETION:

Open Hole  Straight Wall  Underreamed  
 Gravel Packed  Other \_\_\_\_\_  
If Gravel Packed give interval ... from 200 ft. to 245 ft.

From (ft.) To (ft.) Description and color of formation material

0	-	2	Dark Brown Sandy Clay
2	-	35	Reddish Tan Sandy Clay w/Calcareous Nodules
5	-	40	Light Tan Sandy Clay (Caliche)
	-	45	Reddish Tan Sandy Clay w/Calcareous Nodules
5	-	185	Reddish Tan Clayey Sand w/Calcareous Nodules
185	-	190	Reddish Tan Clayey Sand
190	-	205	Tan Sand (Well Sorted) Fine Grain

(Use reverse side if necessary)

8) CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (In.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., If commercial	Setting (ft.)		Gage Casting Screen
			From	To	
4	New	Plastic (Solid)	0	205	Sch. 40
4	New	Plastic (Perf.)	205	245	.020

9) CEMENTING DATA [Rule 287.44(1)]

Cemented from 0 ft. to 195 ft. No. of Sacks Used 54  
\_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Sacks Used \_\_\_\_\_  
Method used Tremie/Slurry  
Cemented by Peterson Drilling & Testing, Inc.

13) TYPE PUMP:

Turbine  Jet  Submersible  Cylinder  
 Other N/A  
Depth to pump bowls, cylinder, jet, etc., \_\_\_\_\_ ft.

14) WELL TESTS:

Type Test:  Pump  Baller  Jetted  Estimated  
Yield: 7 gpm with 6' ft. drawdown after 1 hrs.

15) WATER QUALITY:

Did you knowingly penetrate any strata which contained undesirable constituents?  
 Yes  No If yes, submit "REPORT OF UNDESIRABLE WATER"  
Type of water? Perched Depth of strata 219.50  
Was a chemical analysis made?  Yes  No

10) SURFACE COMPLETION

Specified Surface Slab Installed [Rule 287.44(2)(A)]  
 Specified Steel Sleeve Installed [Rule 287.44(3)(A)]  
 Pitless Adapter Used [Rule 287.44(3)(B)]  
 Approved Alternative Procedure Used [Rule 287.71]

11) WATER LEVEL:

Static level 219.50 ft. below land surface Date 7-20-94  
Artesian flow \_\_\_\_\_ gpm. Date \_\_\_\_\_

12) PACKERS:

Type \_\_\_\_\_ Depth \_\_\_\_\_  
N/A

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Peterson Drilling & Testing, Inc.  
(Type or print)

WELL DRILLER'S LICENSE NO. 3045 M

  Rt. 7 Box 636 Amarillo Texas 79118  
(Street or RFD) (City) (State) (Zip)  
(Signed) Lee Roth  
(Licensed Well Driller)

(Signed) John Ballou  
(Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

For TWC use only: Well No. \_\_\_\_\_ Located on map \_\_\_\_\_



ATTENTION OWNER: *Confidentiality  
Privilege Notice on Reverse Side*

MW-3

State of Texas  
WELL REPORT

Texas Water Well Drillers Board  
P.O. Box 13087  
Austin, Texas 78711

OWNER City of Amarillo ADDRESS P O Box 1971 Amarillo, Texas 79186  
(Name) (Street or RFD) (City) (State) (Zip)

LOCATION OF WELL: County Potter 10 miles in West direction from Amarillo  
(NE, SW, etc.) (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

LEGAL DESCRIPTION: Section No. 126 Block No. 6 Township Amarillo County Potter Survey Name B S & F  
Distance and direction from two intersecting section or survey lines \_\_\_\_\_  
 SEE ATTACHED MAP

3) TYPE OF WORK (Check):  New Well  Deepening  Reconditioning  Plugging  
4) PROPOSED USE (Check):  Domestic  Industrial  Monitor  Public Supply  Irrigation  Test Well  Injection  De-Watering  
5) DRILLING METHOD (Check):  Mud Rotary  Air Hammer  Jetted  Bored  Air Rotary  Cable Tool  Other \_\_\_\_\_  Driven

6) WELL LOG: Date Drilling: Started 7-20- 19 94 Completed 7-20- 19 94  
DIAMETER OF HOLE: Dia. (In.) From (ft.) To (ft.)  
9-7/8 Surface 250  
7) BOREHOLE COMPLETION:  Open Hole  Straight Wall  Underreamed  Gravel Packed  Other \_\_\_\_\_  
If Gravel Packed give Interval ... from 200 ft. to 250 ft.

From(ft):	To(ft)	Description and color of formation material
0	3	Brown Sand Clay
3	10	Reddish Brown Sandy Clay w/Calcareous Nodules
10	15	Tan Sandy Clay (Caliche Stringer)
15	25	Reddish Tan Sandy Clay w/Calcareous Nodules
25	36	Tan Sandy Clay (Caliche Stringer)
36	60	Reddish Tan Sandy Clay w/Calcareous Nodules
60	89	Reddish Tan Clayey Sand w/Calcareous Nodules
89	113	Light Tan Clay Sand w/Calcareous Nodules
113	177	Reddish Tan Clayey Sand w/Calcareous Nodules
177	245	Tan Sand w/Calcareous Nodules

(Use reverse side if necessary)

8) CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (In.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Casting Screen
			From	To	
4	New	Plastic (Solid)	0	207	Sch.40
4	New	Plastic (Perf)	207	247	.020

13) TYPE PUMP:  Turbine  Jet  Submersible  Cylinder  Other N/A  
Depth to pump bowls, cylinder, jet, etc., \_\_\_\_\_ ft.

14) WELL TESTS: Type Test:  Pump  Baller  Jetted  Estimated  
Yield: 5 gpm with 10 ft. drawdown after 1 hrs.

15) WATER QUALITY: Did you knowingly penetrate any strata which contained undesirable constituents?  
 Yes  No If yes, submit "REPORT OF UNDESIRABLE WATER"  
Type of water? Perched Depth of strata 203.65  
Was a chemical analysis made?  Yes  No

9) CEMENTING DATA [Rule 287.44(1)]  
Cemented from 0 ft. to 5 ft. No. of Sacks Used 54  
\_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Sacks Used \_\_\_\_\_  
Method used Tremie  
Cemented by Peterson Drilling & Testing, Inc.

10) SURFACE COMPLETION  Specified Surface Slab Installed [Rule 287.44(2)(A)]  Specified Steel Sleeve Installed [Rule 287.44(3)(A)]  Pitless Adapter Used [Rule 287.44(3)(B)]  Approved Alternative Procedure Used [Rule 287.71]

11) WATER LEVEL: Static level 203.65 ft. below land surface Date 7-26-94  
Artesian flow \_\_\_\_\_ gpm. Date \_\_\_\_\_

12) PACKERS: Type \_\_\_\_\_ Depth \_\_\_\_\_  
N/A

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Peterson Drilling & Testing, Inc. WELL DRILLER'S LICENSE NO. 3045M  
(Type or print)  
Rt Box 636 Amarillo, Texas 79186  
(Street or RFD) (City) (State) (Zip)  
(Signed) [Signature] (Signed) [Signature]  
(Licensed Well Driller) (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

For TWC use only: Well No. \_\_\_\_\_ Located on map \_\_\_\_\_



ATTENTION OWNER: *Confidentially*  
Privilege Notice on Reverse Side

MW-4

### State of Texas WELL REPORT

Texas Water Well Drillers Board  
P.O. Box 13087  
Austin, Texas 78711

OWNER City of Amarillo ADDRESS P O Box 1971 Amarillo, Texas 79186  
(Name) (Street or RFD) (City) (State) (Zip)

LOCATION OF WELL:  
County Potter 10 miles in West direction from Amarillo  
(NE, SW, etc.) (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

LEGAL DESCRIPTION: County Amarillo  
Section No. 126 Block No. 6 Township Amarillo Abstract No. Potter Survey Name B S & F  
Distance and direction from two intersecting section or survey lines \_\_\_\_\_  
 SEE ATTACHED MAP

3) TYPE OF WORK (Check):  New Well  Deepening  Reconditioning  Plugging  
4) PROPOSED USE (Check):  Domestic  Industrial  Monitor  Public Supply  Irrigation  Test Well  Injection  De-Watering  
5) DRILLING METHOD (Check):  Driven  Mud Rotary  Air Hammer  Jetted  Bored  Air Rotary  Cable Tool  Other \_\_\_\_\_

6) WELL LOG: DIAMETER OF HOLE  
Date Drilling: \_\_\_\_\_  
Started 8-11 19 94  
Completed 8-17 19 94  
Diameter of Hole: Dia. (In.) From (ft.) To (ft.)  
9-7/8 Surface 190  
7) BOREHOLE COMPLETION:  Open Hole  Straight Wall  Underreamed  
 Gravel Packed  Other \_\_\_\_\_  
If Gravel Packed give interval ... from 136 ft. to 190 ft.

From (ft.)	To (ft.)	Description and color of formation material	8) CASING, BLANK PIPE, AND WELL SCREEN DATA:
			Dia. (In.)   New or Used   Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial   Setting (ft.) From   To   Gage Casting Screen
0'	3'	Dark Brown Sandy Clay	4 New Plastic (Solid) 0 142 Sch.40
3'	32'	Reddish Tan Sandy Clay w/ Calcareous Nodules	4 New Plastic (Perf) 142 182 .020
32'	43'	Light Tan Caliche Cap	
43'	142'	Reddish Tan Clayey Sand w/ Calcareous Nodules	
142'	152'	Tan Sand (fine grain) w/ Calcareous Nodules	
152'	168'	Tan Sand w/ Pea Gravel w/ Calcareous Nodules (Use reverse side if necessary)	

9) CEMENTING DATA [Rule 287.44(1)]  
Cemented from 0 ft. to 131 ft. No. of Sacks Used 18  
Method used Tremie  
Cemented by Peterson Drilling & Testing, Inc.

10) SURFACE COMPLETION  
 Specified Surface Slab Installed [Rule 287.44(2)(A)]  
 Specified Steel Sleeve Installed [Rule 287.44(3)(A)]  
 Pileless Adapter Used [Rule 287.44(3)(B)]  
 Approved Alternative Procedure Used [Rule 287.71]

11) WATER LEVEL:  
Static level 154.25 ft. below land surface Date 8-20-94  
Artesian flow \_\_\_\_\_ gpm. Date \_\_\_\_\_

12) PACKERS: Type \_\_\_\_\_ Depth \_\_\_\_\_  
N/A

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Peterson Drilling & Testing, Inc. WELL DRILLER'S LICENSE NO. 3045M  
(Type or print)  
SS Rt 7 Box 636 Amarillo, Texas 79186  
(Street or RFD) (City) (State) (Zip)  
(Signed) [Signature] (Signed) [Signature]  
(Licensed Well Driller) (Registered Driller/Trained)

Please attach electric log, chemical analysis, and other pertinent information, if available. For TWC use only: Well No. \_\_\_\_\_ Located on map \_\_\_\_\_





ATTENTION OWNER: Confidentiality  
Privilege Notice on Reverse Side

State of Texas  
WELL REPORT

Texas Water Well Drillers Board  
P.O. Box 13087  
Austin, Texas 78711

MW-5

OWNER City of Amarillo ADDRESS P O Box 1971 Amarillo, Texas 79186  
(Name) (Street or RFD) (City) (State) (Zip)

LOCATION OF WELL:  
County Potter 10 miles in West direction from Amarillo  
(NE, SW, etc.) (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

LEGAL DESCRIPTION:  
Section No. 126 Block No. 6 Township Amarillo County Potter Abstract No. XXXX Survey Name B S & F  
Distance and direction from two intersecting section or survey lines \_\_\_\_\_  
 SEE ATTACHED MAP

3) TYPE OF WORK (Check):

New Well  Deepening  
 Reconditioning  Plugging

4) PROPOSED USE (Check):

Domestic  Industrial  Monitor  Public Supply  
 Irrigation  Test Well  Injection  De-Watering

5) DRILLING METHOD (Check):

Mud Rotary  Air Hammer  Jetted  Bored  
 Air Rotary  Cable Tool  Other \_\_\_\_\_

6) WELL LOG:

Date Drilling: \_\_\_\_\_  
Started 8-19 1994  
Completed 8-20 1994

DIAMETER OF HOLE

Dia. (in.)	From (ft.)	To (ft.)
9-7/8	Surface	140

7) BOREHOLE COMPLETION:

Open Hole  Straight Wall  Underreamed

Gravel Packed  Other \_\_\_\_\_  
If Gravel Packed give interval ... from 80 ft. to 140 ft.

From (ft.) To (ft.) Description and color of formation material

0' - 4'	Reddish Brown Sandy Clay w/ Calcareous Nodules
4' - 9'	Light Tan Caliche
9' - 24'	Reddish Brown Sandy Clay w/ Calcareous Nodules
24' - 50'	Light Tan Sandy Clay (Caliche)
50' - 55'	Reddish Brown Sandy Clay
55' - 80'	Reddish Tan Clayey Sand w/ Calcareous Nodules
80' - 84'	Medium-Course Gravel

(Use reverse side if necessary)

8) CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (in.)	New or Used	Steel, Plastic, etc. Port., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Casting Screen
			From	To	
4	New	Plastic (solid)	0	85	Sch 40
4	New	Plastic (perf)	85	140	.020

9) CEMENTING DATA [Rule 287.44(1)]

Cemented from 0 ft. to 75 ft. No. of Sacks Used 13  
\_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Sacks Used \_\_\_\_\_  
Method used Tremie  
Cemented by Peterson Drilling & Testing, Inc.

13) TYPE PUMP:

Turbine  Jet  Submersible  Cylinder  
 Other N/A

Depth to pump bowls, cylinder, jet, etc., \_\_\_\_\_ ft.

14) WELL TESTS:

Type Test:  Pump  Baller  Jetted  Estimated  
Yield: 3 gpm with 6 ft. drawdown after 15-min hrs.

15) WATER QUALITY:

Did you knowingly penetrate any strata which contained undesirable constituents?

Yes  No If yes, submit "REPORT OF UNDESIRABLE WATER"

Type of water? perched Depth of strata 124.0

Was a chemical analysis made?  Yes  No

10) SURFACE COMPLETION

Specified Surface Slab Installed [Rule 287.44(2)(A)]  
 Specified Steel Sleeve Installed [Rule 287.44(3)(A)]  
 Pileless Adapter Used [Rule 287.44(3)(B)]  
 Approved Alternative Procedure Used [Rule 287.71]

11) WATER LEVEL:

Static level 124.0 ft. below land surface Date 8-24-94  
Artesian flow \_\_\_\_\_ gpm. Date \_\_\_\_\_

12) PACKERS:

Type \_\_\_\_\_ Depth \_\_\_\_\_  
N/A

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Peterson Drilling & Testing, Inc. WELL DRILLER'S LICENSE NO. 3045M  
(Type or print)

Rt 7 Box 636 Amarillo, Texas 79186  
(Street or RFD) (City) (State) (Zip)  
(Signed) [Signature] (Licensed Well Driller) (Signed) [Signature] (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

For TWC use only: Well No. \_\_\_\_\_ Located on map \_\_\_\_\_



ATTENTION OWNER: *Confidentially*  
Privilege Notice on Reverse Side

MW-6

### State of Texas WELL REPORT

Texas Water Well Drillers Board  
P.O. Box 13087  
Austin, Texas 78711

OWNER City of Amarillo ADDRESS P O Box 1971 Amarillo, Texas 79186  
 (Name) (Street or RFD) (City) (State) (Zip)

LOCATION OF WELL:  
 County Potter 10 miles in West direction from Amarillo  
 (NE, SW, etc.) (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

LEGAL DESCRIPTION: Section No. 126 Block No. 6 Township Amarillo County Potter Abstract No. Potter Survey Name B S & F  
 Distance and direction from two intersecting section or survey lines \_\_\_\_\_  
 SEE ATTACHED MAP

#### 3) TYPE OF WORK (Check):

New Well  Deepening  
 Reconditioning  Plugging

#### 4) PROPOSED USE (Check):

Domestic  Industrial  Monitor  Public Supply  
 Irrigation  Test Well  Injection  De-Watering

#### 5) DRILLING METHOD (Check):

Mud Rotary  Air Hammer  Jetted  Bored  
 Air Rotary  Cable Tool  Other \_\_\_\_\_

#### 6) WELL LOG:

Date Drilling:  
 Started 8-17 10 94  
 Completed 8-18 10 94

#### DIAMETER OF HOLE

Dia. (in.)	From (ft.)	To (ft.)
<u>9-7/8</u>	<u>Surface</u>	<u>180</u>

#### 7) BOREHOLE COMPLETION:

Open Hole  Straight Wall  Underreamed  
 Gravel Packed  Other \_\_\_\_\_  
 If Gravel Packed give Interval ... from 129 ft. to 180 ft.

From (ft.)	To (ft.)	Description and color of formation material
<u>0' - 15'</u>		<u>Caliche (Out-cropping)</u>
<u>15' - 25'</u>		<u>Light Tan Sandy Clay (Caliche)</u>
<u>25' - 135'</u>		<u>Reddish Tan Clayey Sand w/ Calcareous Nodules</u>
<u>135' - 140'</u>		<u>Light Tan Caliche</u>
<u>140' - 145'</u>		<u>Light Tan Caliche Nodules</u>
<u>145' - 150'</u>		<u>Tan Sand w/ Calcareous Nodules</u>
<u>150' - 165'</u>		<u>Tan Sand(well-sorted) w/ Calcareous Nodules</u>
<u>165' - 175'</u>		<u>Reddish Tan Sand w/ Calcareous (over) Nodules</u> <i>(Use reverse side if necessary)</i>

#### 8) CASING, BLANK PIPE, AND WELL SCREEN DATA:

Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., If commercial	Setting (ft.)		Gage Casting Screen
			From	To	
<u>4</u>	<u>New</u>	<u>Plastic (solid)</u>	<u>0</u>	<u>136</u>	<u>sch 4C</u>
<u>4</u>	<u>New</u>	<u>Plastic (perf)</u>	<u>136</u>	<u>176</u>	<u>.020</u>

#### 9) CEMENTING DATA [Rule 287.44(1)]

Cemented from 0 ft. to 124 ft. No. of Sacks Used 18  
 \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Sacks Used \_\_\_\_\_  
 Method used Tremie  
 Cemented by Peterson Drilling & Testing, Inc.

#### 10) SURFACE COMPLETION

Specified Surface Slab Installed [Rule 287.44(2)(A)]  
 Specified Steel Sleeve Installed [Rule 287.44(3)(A)]  
 Pileless Adapter Used [Rule 287.44(3)(B)]  
 Approved Alternative Procedure Used [Rule 287.71]

#### 11) WATER LEVEL:

Static level 149.02 ft. below land surface Date 8-19-94  
 Artesian flow \_\_\_\_\_ gpm. Date \_\_\_\_\_

#### 12) PACKERS:

Type \_\_\_\_\_ Depth \_\_\_\_\_  
N/A

#### 13) TYPE PUMP:

Turbine  Jet  Submersible  Cylinder  
 Other N/A  
 Depth to pump bowls, cylinder, jet, etc., \_\_\_\_\_ ft.

#### 14) WELL TESTS:

Type Test:  Pump  Bailor  Jetted  Estimated  
 Yield: 10 gpm with 16 ft. drawdown after 1 hrs.

#### 15) WATER QUALITY:

Did you knowingly penetrate any strata which contained undesirable constituents?  
 Yes  No If yes, submit "REPORT OF UNDESIRABLE WATER"  
 Type of water? perched Depth of strata 149.02  
 Was a chemical analysis made?  Yes  No

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Peterson Drilling & Testing, Inc. WELL DRILLER'S LICENSE NO. 3045M  
 (Type or print)  
 Address Rt 7 Box 636 Amarillo, Texas 79186  
 (Street or RFD) (City) (State) (Zip)  
 (Signed) Lee Peters (Signed) John Ballance  
 (Licensed Well Driller) (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

For TWC use only: Well No. \_\_\_\_\_ Located on map \_\_\_\_\_



ATTENTION OWNER: *Confidentially*  
Privilege Notice on Reverse Side

PZ-1

State of Texas  
WELL REPORT

Texas Water Well Drillers Board  
P.O. Box 13087  
Austin, Texas 78711

OWNER City of Amarillo ADDRESS P O Box 1971 Amarillo, Texas 79186  
(Name) (Street or RFD) (City) (State) (Zip)

2) LOCATION OF WELL:  
County Potter 10 miles in West direction from Amarillo  
(NE, SW, etc.) (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

LEGAL DESCRIPTION: Section No. 126 Block No. 6 Township Amarillo County Potter Survey Name B S & F

Distance and direction from two intersecting section or survey lines \_\_\_\_\_

SEE ATTACHED MAP

3) TYPE OF WORK (Check):  New Well  Deepening  Reconditioning  Plugging

4) PROPOSED USE (Check):  Domestic  Industrial  Monitor  Public Supply  Irrigation  Test Well  Injection  De-Watering

5) DRILLING METHOD (Check):  Drive  Mud Rotary  Air Hammer  Jetted  Borec  Air Rotary  Cable Tool  Other \_\_\_\_\_

6) WELL LOG: Date Drilling: Started 7-30 19 94 Completed 8-2 19 94

DIAMETER OF HOLE		
Dia. (in.)	From (ft.)	To (ft.)
9-7/8	Surface	250

7) BOREHOLE COMPLETION:  Open Hole  Straight Wall  Underreamed  Gravel Packed  Other \_\_\_\_\_  
If Gravel Packed give interval ... from 200 ft. to 250 ft.

From (ft.)	To (ft.)	Description and color of formation material	8) CASING, BLANK PIPE, AND WELL SCREEN DATA:					
			Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., If commercial	Setting (ft.)	Gage Casing Screen	
					From To			
0	3	Brown Sandy Clay						
3	5	Reddish Brown Sandy Clay						
5	50	Reddish Tan Sandy Clay w/Calcareous Nodules	4	New	Plastic (Solid)	0	205	Sch. 4
50	60	Reddish Tan Clayey Sand w/Calcareous Nodules	4	New	Plastic (Perf)	205	245	.020
60	70	Light Tan (Caliche Cap)						
70	187	Reddish Tan Clayey Sand w/Calcareous Nodules						
187	205	Tan Sand (Well Sorted) Fine Grain <i>(Use reverse side if necessary)</i>						

9) CEMENTING DATA [Rule 287.44(1)]  
Cemented from 0 ft. to 195 ft. No. of Sacks Used 54  
\_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Sacks Used \_\_\_\_\_  
Method used Tremie  
Cemented by Peterson Drilling & Testing, Inc

13) TYPE PUMP:  Turbine  Jet  Submersible  Cylinder  Other \_\_\_\_\_  
Depth to pump bowls, cylinder, jet, etc., \_\_\_\_\_ ft.

10) SURFACE COMPLETION  Specified Surface Slab Installed [Rule 287.44(2)(A)]  Specified Steel Sleeve Installed [Rule 287.44(3)(A)]  Pitless Adapter Used [Rule 287.44(3)(B)]  Approved Alternative Procedure Used [Rule 287.71]

14) WELL TESTS: Type Test:  Pump  Baller  Jetted  Estimated  
Yield: 7 gpm with 10 ft. drawdown after 1 hrs.

11) WATER LEVEL: Static level 217.50 ft. below land surface Date 8-4-94  
Artesian flow \_\_\_\_\_ gpm. Date \_\_\_\_\_

15) WATER QUALITY: Did you knowingly penetrate any strata which contained undesirable constituents?  
 Yes  No If yes, submit "REPORT OF UNDESIRABLE WATER"  
Type of water? Perched Depth of strata 217.50  
Was a chemical analysis made?  Yes  No

12) PACKERS: Type \_\_\_\_\_ Depth \_\_\_\_\_  
N/A

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Peterson Drilling & Testing, Inc. WELL DRILLER'S LICENSE NO. 3045M  
(Type or print)

ADDRESS Rt 7 Box 636 Amarillo, Texas 79186  
(Street or RFD) (City) (State) (Zip)

(Signed) [Signature] (Licensed Well Driller) (Signed) [Signature] (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available.

For TWC use only: Well No. \_\_\_\_\_ Located on map \_\_\_\_\_



ATTENTION OWNER: *Confidentiality*  
 Privilege Notice on Reverse Side

PZ-2

State of Texas  
 WELL REPORT

Texas Water Well Drillers Board  
 P.O. Box 13087  
 Austin, Texas 78711

OWNER City of Amarillo ADDRESS P O Box 1971 Amarillo, Texas 79186  
 (Name) (Street or RFD) (City) (State) (Zip)

LOCATION OF WELL:  
 County Potter 10 miles in West direction from Amarillo  
 (NE, SW, etc.) (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

LEGAL DESCRIPTION: Section No. 126 Block No. 6 Township Amarillo County Potter Survey Name B S & F  
 Distance and direction from two intersecting section or survey lines \_\_\_\_\_  
 SEE ATTACHED MAP

3) TYPE OF WORK (Check): <input checked="" type="checkbox"/> New Well <input type="checkbox"/> Deepening <input type="checkbox"/> Reconditioning <input type="checkbox"/> Plugging	4) PROPOSED USE (Check): <input type="checkbox"/> Domestic <input type="checkbox"/> Industrial <input checked="" type="checkbox"/> Monitor <input type="checkbox"/> Public Supply <input type="checkbox"/> Irrigation <input type="checkbox"/> Test Well <input type="checkbox"/> Injection <input type="checkbox"/> De-Watering	5) DRILLING METHOD (Check): <input checked="" type="checkbox"/> Mud Rotary <input type="checkbox"/> Air Hammer <input type="checkbox"/> Jetted <input type="checkbox"/> Bored <input type="checkbox"/> Air Rotary <input type="checkbox"/> Cable Tool <input type="checkbox"/> Other _____
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6) WELL LOG: Date Drilling: Started <u>7-27</u> 19 <u>94</u> Completed <u>7-30</u> 19 <u>94</u>	DIAMETER OF HOLE			7) BOREHOLE COMPLETION: <input type="checkbox"/> Open Hole <input type="checkbox"/> Straight Wall <input type="checkbox"/> Underreamed <input checked="" type="checkbox"/> Gravel Packed <input type="checkbox"/> Other _____ If Gravel Packed give Interval ... from <u>190</u> ft. to <u>240</u> ft.
	Dia. (in.)	From (ft.)	To (ft.)	
	<u>9-7/8</u>	Surface	<u>240</u>	

From (ft.)	To (ft.)	Description and color of formation material	Dia. (in.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., If commercial	Setting (ft.)		Gage Casting Screen
						From	To	
0'	3'	Brown Sandv Clay						
3'	11'	Reddish Brown Sandy Clay						
11'	47'	Reddish Tan Sandy Clay w/ Calcareous Nodules	4	New	Plastic (solid)	0	195	sch 40
47'	56'	Reddish Tan Clayey Sand w/ Calcareous Nodules	4	New	Plastic (perf)	195	235	.020
56'	70'	Light Tan Caliche Cap						
70'	188'	Reddish Tan Clayey Sand w/ Calcareous Nodules						

8) CASING, BLANK PIPE, AND WELL SCREEN DATA:

9) CEMENTING DATA [Rule 287.44(1)]  
 Cemented from 0 ft. to 185 ft. No. of Sacks Used 26  
 \_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Sacks Used \_\_\_\_\_  
 Method used Tremie  
 Cemented by Peterson Drilling & Testing, Inc.

13) TYPE PUMP:  
 Turbine     Jet     Submersible     Cylinder  
 Other \_\_\_\_\_  
 Depth to pump bowls, cylinder, jet, etc., \_\_\_\_\_ ft.

10) SURFACE COMPLETION  
 Specified Surface Slab Installed [Rule 287.44(2)(A)]  
 Specified Steel Sleeve Installed [Rule 287.44(3)(A)]  
 Pitless Adapter Used [Rule 287.44(3)(B)]  
 Approved Alternative Procedure Used [Rule 287.71]

14) WELL TESTS:  
 Type Test:  Pump     Baller     Jetted     Estimated  
 Yield: 7 gpm with 16 ft. drawdown after 1 hrs.

11) WATER LEVEL:  
 Static level 203.52 ft. below land surface    Date 8-2-94  
 Artesian flow \_\_\_\_\_ gpm.    Date \_\_\_\_\_

12) PACKERS:    Type    Depth  
N/A

15) WATER QUALITY:  
 Did you knowingly penetrate any strata which contained undesirable constituents?  
 Yes     No    If yes, submit "REPORT OF UNDESIRABLE WATER"  
 Type of water? perched    Depth of strata 203.52  
 Was a chemical analysis made?     Yes     No

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Peterson Drilling & Testing, Inc. WELL DRILLER'S LICENSE NO. 3045M  
 (Type or print)

Address Rt 7 Box 636 Amarillo, Texas 79186  
 (Street or RFD) (City) (State) (Zip)

(Signed) Lee Peters (Licensed Well Driller) (Signed) John Ballard (Registered Driller Trainee)

Please attach electric log, chemical analysis, and other pertinent information, if available. For TWC use only: Well No. \_\_\_\_\_ Located on map \_\_\_\_\_





ATTENTION OWNER: Confidentiality  
Privilege Notice on Reverse Side

State of Texas  
WELL REPORT

Texas Water Well Drillers Board  
P.O. Box 13087  
Austin, Texas 78711

PZ-3

1) OWNER City of Amarillo ADDRESS P O Box 1971 Amarillo, Texas 79186  
(Name) (Street or RFD) (City) (State) (Zip)  
2) LOCATION OF WELL:  
County Potter 10 miles in West direction from Amarillo  
(NE, SW, etc.) (Town)

Driller must complete the legal description below with distance and direction from two intersecting section or survey lines, or he must locate and identify the well on an official Quarter- or Half-Scale Texas County General Highway Map and attach the map to this form.

LEGAL DESCRIPTION: County Amarillo  
Section No. 126 Block No. 6 Township Amarillo District No. Potter Survey Name B S & F  
Distance and direction from two intersecting section or survey lines \_\_\_\_\_  
 SEE ATTACHED MAP

3) TYPE OF WORK (Check):  New Well  Deepening  Reconditioning  Plugging  
4) PROPOSED USE (Check):  Domestic  Industrial  Monitor  Public Supply  Irrigation  Test Well  Injection  De-Watering  
5) DRILLING METHOD (Check):  Drift  Mud Rotary  Air Hammer  Jetted  Box  Air Rotary  Cable Tool  Other \_\_\_\_\_

6) WELL LOG: DIAMETER OF HOLE  
Date Drilling: \_\_\_\_\_  
Started 8-22 19 94 Dia. (In.) 9-7/8 From (ft.) Surface To (ft.) 172  
Completed 8-24 19 94  
7) BOREHOLE COMPLETION:  Open Hole  Straight Wall  Underreamed  
 Gravel Packed  Other \_\_\_\_\_  
If Gravel Packed give Interval ... from 120 ft. to 172 ft.

From (ft.)	To (ft.)	Description and color of formation material	8) CASING, BLANK PIPE, AND WELL SCREEN DATA:					
			Dia. (In.)	New or Used	Steel, Plastic, etc. Perf., Slotted, etc. Screen Mfg., if commercial	Setting (ft.)		Gage Cast Scre
						From	To	
0'	25'	Hard Caliche Cap						
25'	30'	Reddish Brown Clayey Sand w/ Calcareous Nodules	4	New	Plastic (solid)	0	125	Sch
30'	130'	Reddish Tan Clayey Sand w/ Calcareous Nodules	4	New	Plastic (perf)	125	165	02
30'	140'	Tan Sand (well sorted) fine grain w/ Small Gravel						
140'	175'	Reddish Tan Sand (well-sorted) Fine Grain w/ Small Gravel						

9) CEMENTING DATA [Rule 287.44(1)]:  
Cemented from 0 ft. to 115 ft. No. of Sacks Used 20  
\_\_\_\_\_ ft. to \_\_\_\_\_ ft. No. of Sacks Used \_\_\_\_\_  
Method used Tremie  
Cemented by Peterson Drilling & Testing, Inc.

10) SURFACE COMPLETION  
 Specified Surface Slab Installed [Rule 287.44(2)(A)]  
 Specified Steel Sleeve Installed [Rule 287.44(3)(A)]  
 Pitless Adaptor Used [Rule 287.44(3)(B)]  
 Approved Alternative Procedure Used [Rule 287.71]

11) WATER LEVEL:  
Static level 147.10 ft. below land surface Date 8-25-94  
Artesian flow \_\_\_\_\_ gpm. Date \_\_\_\_\_

12) PACKERS: Type \_\_\_\_\_ Depth \_\_\_\_\_  
N/A

I hereby certify that this well was drilled by me (or under my supervision) and that each and all of the statements herein are true to the best of my knowledge and belief. I understand that failure to complete items 1 thru 15 will result in the log(s) being returned for completion and resubmittal.

COMPANY NAME Peterson Drilling & Testing, Inc. WELL DRILLER'S LICENSE NO. 3045M  
(Type or print)

ADDRESS Rt 1 Box 686 Amarillo, Texas 79186  
(Street or RFD) (City) (State) (Zip)  
(Signed) [Signature] (Signed) [Signature]  
(Licensed Well Driller) (Registered Driller/Taloo)

Please attach electric log, chemical analysis, and other pertinent information, if available. For TWC use only: Well No. \_\_\_\_\_ Located on map \_\_\_\_\_



**APPENDIX F**

**1975 SITE INVESTIGATION REPORT**